SAFETY V STAVBAH

MINISTRY FOR NATURAL VERSIONS AND SPACE

Technical guideline

TSG-1-001: 2026

SAFETY SAFETY IN BUILDINGS

Spread of fire to neighboring buildings

Load-bearing capacity of the structure and spread of fire in buildings

Evacuation routes and fire reporting and alarm systems

Firefighting and firefighter access apparatus

betrayal

5.0

REPUBLIC OF SLOVENIA
MINISTRY FOR THE ENVIRONMENT AND SPACE

TECHNICAL GUIDELINES TSG-1-001:2026

Pursuant to Article 36(6) of the Construction Act (GZ-1) (UL RS Nos 199/21, 105/22 – ZZNŠPP and 133/23), the Minister for the Environment and Spatial Planning issues a technical guideline.

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Spread of fire to neighboring buildings
Load-bearing capacity of the structure and spread of fire in buildings
Evacuation routes and fire reporting and alarm systems
Firefighting and firefighter access apparatus

Minister for the Environment and Spatial Planning
mag. POLONA RIFELJ

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0 INTRODUCTION

0.1 RECOGNITION AND APPLICATION OF THE TECHNICAL GUIDELINES OF SAFETY IN STATEMENTS

0.1.1 Legal basis for issuing the technical guideline

(1) Pursuant to Article 36 of the Construction Act (UL RS Nos 199/21, 105/22 – ZZNŠPP, 133/23 and 85/24 – ZAID-A, 47/25 – odl. US and 75/25; hereinafter: GZ-1) was issued by the Minister for the Environment and Spatial Planning, who is responsible for the construction of buildings. Article 36 of the GZ-1 provides that the technical guideline for the construction of buildings for certain types of buildings shall precisely define the recommended technical solutions that achieve the fulfilment of the essential requirements for the design, construction and maintenance of buildings and the selected levels or classes of construction products and materials that may be installed and the method of their installation. The technical guidelines shall also specify, for certain types of facilities, the recommended technical solutions relating to compliance with other requirements.

(2) Article 25 of the GZ-1 stipulates that facilities must meet essential requirements with regard to the purpose, type, size, capacity, anticipated impacts and other characteristics of the facility and other requirements. The essential requirements referred to in this Article of the Act must be taken into account in the case of new constructions and reconstructions of buildings or other alterations to buildings. In the case of repurposing or maintenance of buildings, the fire safety of the building must not be impaired by such interventions. For buildings protected on the basis of regulations on the protection of cultural heritage, exceptions to the provision of essential requirements and thus also to the provision of fire safety may be applied, as provided for in Article 25(6) GZ-1.

(3) The essential requirements laid down by GZ-1 for buildings are:

1. mechanical resistance and stability,
2. fire safety,
3. hygiene, health and environmental protection,
4. safety in use,
5. protection from noise,
6. energy saving, heat conservation and use of renewable energy sources,
7. universal construction and use of facilities; and
8. sustainable use of natural resources.

(4) Article 37 of the GZ-1 sets out the order of other normative documents that determine the rules, orientations, characteristics for activities or their results, i.e. also ensuring the essential requirements of buildings and thus also the fire safety of buildings. As set out in the regulation on fire safety, technical guidelines are used, but other normative documents may also be used. Article 37 sets out the order in which normative documents are to be used:

Technical Construction Guideline (TSG)

the default European standard (SIST EN),

3. original Slovenian Standardisation Document (SIST),

Default International Standard (SIST ISO)

Default foreign standard (e.g. SIST DIN) and

6. other publicly available technical specifications.

(5) Regulations may require the mandatory use of standards or guidelines or provide that a certain element is presumed to comply with the requirements of a building regulation if it meets the requirements of standards or technical guidelines (Article 34 of the GZ-1). If the designer does not apply the recommended method of

design, i.e. does not apply this technical guideline, Article 41 of the GZ-1 must be applied.

The latest state of construction technology is the state which, at the time when a building is being designed or constructed, represents the achieved level of development of the technical capabilities of construction products, processes and services based on the recognised results of science, technology and experience in the field of construction, while taking into account reasonable costs (point 43 of the first paragraph of Article 3 of the GZ-1).

0.1.2 Rules on fire safety in buildings – legal framework for the operation of technical guidelines

(1) From the point of view of the construction of buildings, fire safety is defined in the essential requirement of fire safety described in Article 27 of the GZ-1.

Article 27
(Safety from fire)

(1) In order to reduce the risk to people in or near them and to the environment, facilities must ensure fire safety and enable firefighters and rescuers to take effective and safe action. A sufficient quantity of fire-extinguishing water must be provided.

(2) In the event of a fire, the load-bearing structure of the building must retain the required load-bearing capacity for a certain period of time. In order to limit the rapid spread of fire across the building, construction elements that are difficult to ignite, emit small amounts of heat and smoke when ignited and limit the rapid spread of fire across the surface must be used.

(3) In order to limit the spread of fire throughout the facility, it is necessary to divide the facility into fire sectors.

(4) Facilities must provide a sufficient number of properly implemented evacuation routes and exits at appropriate locations so that people can leave them quickly and safely. In order to ensure the rapid and safe evacuation of people and the rapid intervention of firefighters and rescuers in the facility, fire alarm and alarm systems must be installed in the facility.

(5) Unobstructed and safe access for firefighting and rescue must be ensured in and around the facilities.

(6) Appropriate fire-fighting systems and devices and equipment must be installed or installed in the buildings.

(7) External walls and roofs of buildings, partition walls, along with doors, windows and other breakthroughs, must reduce the risk of spreading fire to neighboring buildings.

(2) This essential requirement is further elaborated in the Rules on fire safety in buildings (UL RS Nos 31/04, 10/05, 83/05, 14/07, 12/13, 61/17 – GZ and 199/21 – GZ-1, hereinafter: Regulation) with the following requirements:

- the spread of fire to neighbouring buildings (Article 3);
- the load-bearing capacity of the structure and the spread of fire in buildings (Article 4),
- evacuation routes and reporting and alarm systems (Article 5),
- fire-fighting and fire-fighting access facilities (Article 6).

The content of those articles of the Rules is set out below before the introduction of points 1 to 4 of this

technical guideline.

(3) In the rules setting out how the prescribed requirements are to be met, the following provisions are of the utmost importance for the application of this technical guideline:

(4) The content of Articles 7 and 8 of the Rules relating to the content of this Guideline is as follows:

Article 7
Issue and application of technical guidelines

(1) The minister responsible for spatial and construction matters shall issue, in agreement with the minister responsible for the placing on the market of construction products, the technical guideline "Fire safety in buildings", which sets out recommended construction measures or solutions for achieving the requirements of these Rules and consists of the following parts:
- the spread of fire to neighbouring buildings (dealing with the requirements of Article 3);
- the load-bearing capacity of the structure and the spread of fire and smoke in buildings (dealing with the requirements of Article 4);
- evacuation routes and fire reporting and alarm systems (treatment of the requirements of Article 5),
- fire-fighting and fire-fighting access facilities (dealing with the requirements of Article 6).

(2) If building measures or solutions are fully used in the construction of buildings (hereinafter: measures) referred to in the technical guideline referred to in the preceding paragraph or in the documents to which it refers, there shall be a presumption of conformity with the requirements referred to in Articles 3 to 6 of these Rules.

Article 8
Application of other measures

(1) In the design and construction of buildings, the following may be used instead of the measures referred to in the technical guideline referred to in the preceding Article:
- measures set out in other standards, technical guidelines, technical specifications, codes of established practice or other documents providing for fire safety measures within the meaning of this Regulation; or
- measures based on calculations in the framework of fire engineering methods.

(2) The measures referred to in the preceding paragraph shall entail the application of the latest state of construction techniques in accordance with the Construction Act. The design according to the state of the art of the construction technique must ensure at least the same level of fire safety as the design according to the technical guideline referred to in the preceding Article.

0.1.3 Legal consequences of (non)application of the technical guideline

a) Application of the technical guideline - presumption of conformity

(1) As can be seen from the previous points of the introduction, this technical guideline merely lists building measures or solutions as a recommended way of meeting the requirements on fire safety in buildings laid down in the Rules. Compliance with the recommended construction measures is the basis for assuming that the requirements of the Rules are met. In that regard, it must be assumed that fire protection measures are, as a general rule, interrelated and their final effect cannot be considered solely on the basis of a case-by-case analysis of each measure, that is to say, without taking into account the results of the overall fire protection concept chosen. Therefore, when selecting the measures under this technical guideline and combining them with the measures listed in the different reference (supporting) documents, the accredited architect or authorised engineer should always ensure their consistency.

Example 1: *A building with a double facade or with an atrium. When designing measures for such a building, the requirements of this technical guideline should be taken into account, as well as, with regard to compliance*

with the requirements for ensuring the load-bearing capacity of the structure, the spread of fire in the building and evacuation routes and reporting and alarm systems, the requirements of the supporting documents CNG 209, Buildings with atriums and inner courtyards and CNG 208, Double façade buildings, which are not defined in this technical guideline but to which the technical guideline refers and which are therefore also considered to be an integral part of the CNG guideline.

Example 2: Some of the buildings are particularly fire-prone. When designing a high-rise building (see definition in point 0.3), CNGV guideline 310 (see point 5.2) must be followed. That guideline also refers to the TSG on certain points. Also in this case, the building is considered to be designed in accordance with the technical guideline.

(2) The burden of proof of non-compliance with the requirements set out in the Rules lies, in the case of the application of this technical guideline, with the competent national authorities or bodies designated by law that supervise the correctness of the design. If the design has followed the construction measures set out in this Technical Guideline, it is not necessary to demonstrate compliance with the relevant regulations, as this is automatically presumed under the provisions of the Regulations. This, of course, applies only in cases where the entire fire safety design relies exclusively on the application of this technical guideline. Design using this technical guideline also means that the supporting documents referred to therein are used only in the manner foreseen therein. It should be noted that this guideline does not interfere with the statutory assumption of responsibility in design, control and construction.

b) Latest state-of-the-art design of construction techniques

(1) If, in accordance with the Rules, the investor, authorised engineer or authorised architect decides to apply (partially or fully) the construction measures from the state of the art, as defined in Article 8 of the Rules, and does not apply the solution from this technical guideline in full, at least the same level of fire safety as provided for in this technical guideline must be ensured (see Article 41(2) GZ-1).

(2) Even when designing after the latest state of construction technology, it must be assumed that fire protection measures are, as a rule, interrelated and their final effect cannot be considered solely on the basis of a case-by-case analysis of each measure, that is to say, without taking into account the results of the entire chosen concept of fire protection.

c) Reconstruction and other alteration of buildings

(1) With regard to the reconstruction of buildings and other alterations to buildings, Article 25(4) and (5) GZ-1 provide that buildings are to be reconstructed, maintained or repurposed in such a way as to meet the essential and other requirements in force at the time of the alteration of the building, whereby verification of compliance with these requirements is limited to those essential and other requirements that are the subject of the alteration of the building. The requirement to comply with essential requirements and other requirements shall not apply where this is technically impossible or involves disproportionate costs. The explanatory memorandum to the Act highlights the application of the regulations in force at the time of the modification of the building, as these represent the currently valid civilisational level of protection of human life and other public interests. At the same time, the text of the article indicates that it is not always possible to raise the existing built stock to the level laid down in the applicable regulations when maintaining, renovating, reconstructing, renovating and other forms of maintaining the good condition of already built buildings. Paragraph 4 expressly provides that, when changing facilities, the subject of consideration may not be expanded and the search for an optimal technical solution is sought only in the part of the facility that is being reconstructed, maintained or repurposed.

(2) The article also answers the question of whether, in the case of the above-mentioned interventions in the building, we can demand an increase in quality to today's standards, neglecting the fact that this may cause social distress due to the loss of residence or workplace, or the deformation of the built environment. In order to avoid such disproportionate solutions, the article enables an engineering approach, which, on the basis of an assessment of the situation and the necessary measures, determines a technical solution that ensures a balance between achieving or approaching the prescribed requirements and feasible solutions that do not interfere with the basic purpose - further use of the facility. Opening an otherwise rigid system of achieving the prescribed requirements provides the investor and other participants in the construction with a tool with which the existing situation can be improved and risks reduced (e.g. for demolition in the event of an earthquake), while at the same time deviating from the otherwise determined construction technical requirements. The risks that investors would consider any intervention in an existing facility to be technically unfeasible and economically disproportionate due to their short-term objectives and lowering the financial burden of higher-

quality renovations are high and the provision should therefore be applied restrictively. Undoubtedly, minor repair of a building must not lead to the demolition of part or the whole of the building. It is equally clear that improvements must be such as to achieve or come as close as possible to the applicable regulatory requirements and that this does not constitute an economically disproportionate measure.

(3) The sixth paragraph of the same Article GZ-1 provides for an exception to the modification of objects protected on the basis of regulations in the field of the protection of cultural heritage. The text of the article provides that the solutions designed or implemented may deviate from or fail to meet the prescribed essential and other requirements if this results from the opinion or the conditions of the competent opinion of the opinion of the author for the field of cultural heritage, provided that the derogation does not directly endanger the safety of the facility, the life and health of people, neighbouring real estate or the environment.

(4) This means that at least in those reconstructions where, due to the conditions of protection of cultural heritage or technical barriers to reconstructions, an alternative combination of preventive or active construction and technical measures must be chosen instead of the measures proposed by this technical guideline, which, taking into account the concretely established limitations and conditions, contributes as much as possible to the fulfilment of the requirements of the acquis in the field of fire protection. Such design is considered to be design according to the state of the art of construction technology within the meaning of the Rules on fire safety in buildings. Alternative solutions should be sought either for the whole building or for part of it.

(5) Even in the case of reconstructions, repurposing and maintenance, it must be assumed that fire protection measures are, as a rule, interrelated and their final effect cannot be considered solely on the basis of a case-by-case analysis of each measure, that is to say, without taking into account the results of the entire chosen concept of fire protection. Once again, we repeat that GZ-1 in Article 25(5) in particular points out that the construction and technical condition of a building must not deteriorate when it is modified.

d) Relationship to the requirements of legal regulations in the field of fire safety

(1) This technical guideline recommends construction measures, which may exceptionally also be subject to other legal provisions. In relation to the applicable regulations, the technical guideline is drafted in such a way that the proposed construction measures do not conflict with the requirements of the regulations in question. However, if its application nevertheless reveals that the implementation of the proposed measure would constitute a breach of the provisions of the applicable legislation, the mandatory requirements of the legislation must be fully respected.

(2) Point 0.2.1 lists the regulations in force at the time of adoption of this technical guideline. The user is obliged to take into account all regulations in force at the time of planning or their amendments and supplements adopted after the publication of this guideline.

e) Maintenance of buildings

(1) What is considered maintenance of a facility is already determined by GZ-1 in point 41 of the first paragraph of Article 3, and in more detail by the Decree on the classification of facilities (Official Gazette of the Republic of Slovenia, No. 96/22) in Article 13 and Annex 3. Some maintenance work, such as energy renovations of buildings, can have a significant impact on fire safety. Participants carrying out maintenance work are responsible for ensuring that, even after the maintenance works have been carried out, the building will meet the fire safety requirements in accordance with the Rules, this guideline, as well as with the provision that "when changing facilities" must not deteriorate the constructional condition of the building.

(2) Maintenance means maintaining the usability of an object: "maintenance of an object are works designed to maintain the usability and value of an object", on the other hand, the same definition of maintenance of an object also refers to "improvements that take into account the progress of technology". Thus, the object element must be maintained in such a way that its usability (and value) is (only) maintained, but it can be maintained by improvements that imply the advancement of the technique. The law does not answer the question: when to maintain a building within the requirements of the construction period (more precisely, the issue of a building permit) and when to maintain it in such a way that we reach (or at least approach) the currently applicable building and other regulations or even exceed it. The answer can be found in three faults that are tied to the service life of the element being maintained. One is the life expectancy of the object element. These are usually not precisely defined, except in the case of multi-apartment buildings, where there is a regulation (Rules on standards of maintenance of residential buildings and apartments, Official Gazette of the Republic of Slovenia, No 102/25). Also for the purposes of determining the value of real estate, insurance and the like, the lifespan or depreciation period of elements of buildings or the entire building is determined.

The second turning point is the lifespan set by the manufacturer for his product, and the third is the decision of the owner – the investor. Maintenance as maintenance of usability and value is carried out until the end of the service life or at the request of the owner also a shorter time, and maintenance as an improvement following the progress of the technique is carried out after the expiration of a certain or expected service life. An exception may be made by a regulation if it sets a mandatory deadline for its replacement for an individual item of a building.

Example: *In the case of energy renovation of the facade of a building where there was previously no thermal insulation, the choice of the lining of the external walls must ensure at least the same fire safety as laid down in the Rules and Guideline. The linings of the exterior walls should not react to fire, and in the case of tall buildings, the linings should be made of non-combustible materials. In the event that the deviation of the building from the border of the adjacent land is insufficient from the point of view of fire safety requirements, the requirements referred to in point 1 of this technical guideline or other equivalent requirements in accordance with Article 8 of the Rules must also be taken into account. However, if the investor decided only to refresh the color of the facade, the contractor or owner must focus only on this element of the building and ensure that fire and other safety will not deteriorate due to the choice of paint.*

0.1.4 Determination of the load-bearing capacity of a structure with the requirements of EUROPE

(1) The essential requirement of the load-bearing capacity of structures referred to in Article 4(2) of the Rules ("Buildings must be designed and built in such a way that their load-bearing structure retains the required load-bearing capacity for a certain period of time in the event of fire") is part of the field also addressed by EUROPE – a group of European standards that define the principles and rules to ensure the safety, usability and durability of buildings, describe the basics of their design and verification, and provide guidance for achieving mechanical resistance and stability of buildings. Since EUROPE are already adopted as the Slovenian national SIST EN standards, it is also possible to determine the load-bearing capacity of a structure in a fire by using them.

(2) The design and provision of mechanical resistance and stability of buildings on the basis of EUROPE is laid down in the Rules on mechanical resistance and stability of buildings (UL RS Nos 101/05, 61/17 – GZ and 199/21 – GZ-1).

(3) The use of the EUROPE group of standards can be used to demonstrate the fire resistance of the load-bearing structure for the required duration of the fire, which are specific times that are part of this guideline taking into account the standard temperature curve for solid fuels. Demonstration of the fire resistance of the load-bearing structure by EUROPE using a natural temperature curve shall be understood as the use of building measures from the state of the art as defined in Article 8 of the Rules on fire safety in buildings. Therefore, it is necessary to ensure at least the same level of fire safety as specified in this technical guideline.

0.1.5 Technical guideline and organizational fire protection measures

Although the organisational measures for fire protection are not the subject of this technical guideline, nor of the building regulations that are superior to it, they had to be taken into account when determining its content, since the building measures proposed in this guideline ensure the necessary fire safety only on the assumption that organisational measures were properly introduced and implemented during the use of the building. Only functioning built-in active fire protection systems, such as fire warning and alarm systems, smoke and heat control and fire-fighting systems, are a guarantee that the selected building measures of fire protection will also achieve the purpose and justify the invested funds. This also applies to the permanent maintenance of the level of preventive measures introduced at the time of construction and related to the selection of building materials and elements (e.g. linings, fire doors and fire dampers). Organisational measures, the implementation of which follows the implementation of construction measures in time, are therefore inextricably linked to the latter, and only the combination of the two leads to the prescribed level of fire safety in buildings. Therefore, point 0.2 of the Reference Documents also mentions certain regulations governing the field of organisational fire protection measures.

0.1.6 Installation of building fire protection products

(1) The fire safety of a building is also ensured by the selection of suitable fire protection materials and their proper installation. The placing on the market of construction products is regulated by Regulation (EU) No 305/2011 of the European Parliament and of the Council of 9 March 2011 laying down harmonised conditions for the marketing of construction products and by the Construction Products Act (UL RS No 82/13).

(2) Only products that are legally placed on the market may be installed, and they must be installed in accordance with the instructions (project) of the authorised architect or authorised engineer and in accordance with the manufacturer's instructions.

(3) This technical guideline is a normative document that precisely defines, for buildings, the technical solutions that achieve the fulfilment of the essential requirements, the chosen level or classes of construction products and materials that may be installed, and the methods of their installation and the methods of carrying out the construction. With regard to the requirements of this technical guideline for construction products covered by harmonised standards, the reference to harmonised standards means that only products duly declared by the manufacturer may be installed in buildings designed on the basis of this technical guideline. This technical guideline constitutes a normative document which, at the level of the Republic of Slovenia, prescribes the indication of essential characteristics for buildings in accordance with Article 5(1) of Regulation (EU) No 305/2011. A product to be incorporated into a building in accordance with this technical guideline must have a declaration of performance in accordance with Article 4 of Regulation (EU) No 305/2011 declaring compliance with all the characteristics laid down for that product by the design documentation for construction on the basis of this technical guideline.

(4) For a (construction) product for which there is no harmonised technical specification (product standard or European Technical Assessment) and the product is legal on the EU market on the basis of conformity assessment procedures carried out according to the national standards of the technical specifications of one of the EU Member States and in accordance with the decisions of the European Commission on the procedure for attesting the conformity of construction products, the reports on the classification of an accredited fire testing body established in the EU according to the relevant standard SIST EN 13501-1, 2, 3, 4 or 5 and the manufacturer's instructions for the installation of the product in the Slovenian language shall be taken into account as evidence of the compliance of the fire performance of construction products with the requirements of this technical guideline.

(5) The Construction Products Act, in conjunction with this technical guideline, in relation to the first paragraph of Article 5 of the Act (… "characteristics related to essential characteristics relating to the basic requirements for construction works and in the context of its intended use") must be understood as "other publicly available technical specifications representing the state of the art and technology".

(6) In order for these requirements to be properly met, it is recommended that the installation of products intended for fire protection be carried out by operators who are professionally qualified for installation.

0.1.7 Relationship with other technical guidelines

The Construction Act allows several technical guidelines to be issued, which raises the question of their simultaneous use. The wording of this guideline is designed in such a way that the solutions it contains do not have conflicting requirements with other technical guidelines. In the event that this is nevertheless established in the design, auditing, approval or construction, the fire safety solutions described in this Guideline should be considered as priority requirements.

0.2 REFERENCE DOCUMENTS[1]

0.2.1 Regulations

1. Construction Act (GZ-1) (UL RS Nos 199/21, 105/22 – ZZNŠPP, 133/23, 85/24 – ZAID-A, 47/25 – odl.

[1] Reference documents referred to in:
- point 0.2.1 can be accessed at: http://www.pisrs.si/Pis.web/
- points 0.2.2 are available at the Slovenian Institute for Standardisation,
- point 0.2.3 can be accessed at the Central Technical Library in Ljubljana or at the Slovenian Fire Protection Association: http://www.szpv.si/guidelines/,
- guidelines issued by individual ministries are available on the central website of the state administration.

US and 75/25),
2. Fire Protection Act (Uradni list RS (UL RS; Official Gazette of the Republic of Slovenia) Nos 3/07 – official consolidated text, 9/11, 83/12, 61/17 – GZ, 189/20 – ZFRO and 43/22),
3. Construction Products Act (Uradni list RS (UL RS; Official Gazette of the Republic of Slovenia) No 82/13),
4. Technical Requirements for Products and Conformity Assessment Act (Uradni list RS (UL RS; Official Gazette of the Republic of Slovenia) Nos 17/11 and 29/23),
5. Chimney-sweeping Services Act (Official Gazette RS, No. 68/16),
6. Housing Act (UL RS Nos 69/03, 18/04 – ZVKSES, 47/06 – ZEN, 45/08 – ZVEtL, 57/08, 62/10 – ZUPJS, 56/11 – odl. US, 87/11, 40/12 – ZUJF, 14/17 – paras. US, 27/17, 59/19, 189/20 – ZFRO, 90/21, 18/23 – ZDU-1O, 77/23 – Constitutional Court decision. US and 61/24),
7. Spatial Planning Act (UL RS Nos 199/21, 18/23 – ZDU-1O, 78/23 – ZUNPEOVE, 95/23 – ZIUOPZP, 23/24 and 109/24);
8. Explosives and Pyrotechnic Articles Act (ZEPI) (UL RS Nos 35/08 and 19/15),
9. the Alternative Fuels Infrastructure and Promotion of the Transition to Alternative Fuels in Transport Act (ZIAG) (Uradni list RS (UL RS; Official Gazette of the Republic of Slovenia) No 62/23),
10. Regulation (EU) No 305/2011 of the European Parliament and of the Council of 9 March 2011 laying down harmonised conditions for the marketing of construction products and repealing Council Directive 89/106/EEC,
11. Decree on the Protection of Documentary and Archival Material (Official Gazette RS, No. 42/17),
12. Decree on the landfill of waste (UL RS Nos 10/14, 54/15, 36/16, 37/18, 13/21 and 44/22 – ZVO-2);
13. Decree on waste incineration plants and waste co-incineration plants (UL RS Nos 8/16, 116/21 and 44/22 – ZVO-2);
14. Decree on the storage of dangerous liquids in stationary storage vessels (UL RS Nos 104/09, 29/10, 105/10 and 44/22 – ZVO-2);
15. Decree on special requirements for facilities containing explosives or pyrotechnic articles (UL RS Nos 124/08, 70/12, 90/12 and 96/13);
16. Decree on drinking water supply (UL RS Nos 88/12, 44/22 – ZVO-2 and 70/24);
17. Decree on inspections, cleaning and measurements of small combustion plants (UL RS Nos 77/17 and 98/24);
18. Decree on the outdoor storage of solid combustible waste (UL RS Nos 53/19 and 44/22 – ZVO-2)
19. Rules on fire safety in buildings (UL RS Nos 31/04, 10/05, 83/05, 14/07, 12/13, 61/17 – GZ and 199/21 – GZ-1);
20. Rules on the ventilation and air-conditioning of buildings (UL RS Nos 42/02, 105/02, 110/02 – ZGO-1, 61/17 – GZ and 199/21 – GZ-1),
21. Rules on technical norms for the hydrant fire-fighting network (Official Gazette of the SFRY, No. 30/91, Official Gazette of the RS, No. 1/95 – ZSta, 59/99 – ZTZPUS, 52/00 – ZGPro, 83/05 and 199/21 – GZ-1),
22. Rules on the safety of lifts (UL RS No 44/24),
23. Rules on project and other documentation and forms in the construction of buildings (Official Gazette of the Republic of Slovenia, No. 30/23)
24. Rules on the Fire Order (UL RS Nos 52/07, 34/11 and 101/11),
25. Rules on graphic signs for the preparation of annexes to fire safety studies and fire orders (Official Gazette of the Republic of Slovenia, No. 138/04),
26. Rules on fire protection (UL RS Nos 107/07, 92/10 and 20/22),
27. Rules on the supervision of installed active fire protection systems (Official Gazette of the Republic of Slovenia No 53/19),
28. Rules on testing hydrant networks (UL RS Nos 22/95, 102/09 and 60/20),
29. Rules on minimum technical and other conditions for the maintenance of hand-held and transport fire extinguishers (UL RS Nos 108/04, 116/07, 102/09 and 55/15),
30. Rules on the selection and installation of fire extinguishers (UL RS No 67/05),
31. Rules on mechanical resistance and stability of buildings (UL RS Nos 101/05, 61/17 – GZ and 199/21 – GZ-1),
32. Rules on Explosion Protection (UL RS No 41/16),
33. Rules on liquefied petroleum gas (UL RS Nos 22/91, 114/04, 17/14 – EZ-1 and 38/24 – EZ-2),
34. Rules on technical conditions for the construction, operation and maintenance of pipelines with a maximum operating pressure not exceeding 16 bar (UL RS Nos 26/02, 54/02, 17/14 – EZ-1 and 38/24 – EZ-2),

35. Rules on technical conditions for the construction, operation and maintenance of pipelines with an operating pressure exceeding 16 bar and on conditions for interventions in the areas of their buffer zones (UL RS Nos 12/10, 45/11, 17/14 – EZ-1 and 38/24 – EZ-2),
36. Rules on the technical requirements for the construction and operation of fuel supply stations for motor vehicles (UL RS Nos 111/09, 61/17 – GZ and 199/21 – GZ-1);
37. Rules on the construction of devices for flammable liquids and on the storage and flow of flammable liquids (Official Gazette of the Socialist Federal Republic of Yugoslavia, Nos 20/71, Official Gazette of the Republic of Slovenia, Nos 114/04, 104/09 and 3/22 – ZDeb),
38. Rules on technical and organisational measures for the storage of hazardous chemicals (UL RS Nos 23/18 and 123/22),
39. Rules on the storage of end-of-life tyres (UL RS Nos 37/11 and 44/22 – ZVO-2),
40. Rules laying down the conditions to be met by tanks intended for the storage of oil and petroleum products for national commodity reserves (UL RS No 52/24),
41. Rules on the standards for the construction and equipment of police detention facilities (UL RS No 62/16),
42. Rules on the requirements for the installation of combustion plants (UL RS Nos 100/13, 61/17 – GZ and 199/21 – GZ-1),
43. Rules on technical norms for shelters and shelters (UL RS Nos 17/98, 26/98 – corr., 25/00, 38/01 and 66/06),
44. Rules on the universal construction and use of buildings (UL RS Nos 41/18 and 199/21 – GZ-1),
45. Rules on temporary facilities (Official Gazette of the Republic of Slovenia, No. 79/22),
46. Rules on minimum spatial and technical conditions for the provision of long-term care (Official Gazette of the Republic of Slovenia, No. 19/24).

EC Commission Decisions determining the reaction-to-fire class without testing:

1. 96/603/EC and 2006/605/EC — non-combustible materials,
2. 2007/348/EC - wood-based panels,
3. 2006/213/EC - Parquet and wooden floor coverings (no formwork),
4. 2000/553/EC – roofing (including concrete and brick roofing tiles), but with a note on the composition testing.

0.2.2 Standards and other standardisation deliverables[2]

1. SIST EN 54 Group of standards for fire detection, fire reporting and alarming,
2. SIST-TS CEN/TS 54-14 Fire detection, fire alarm and alarm systems - Part 14: Guidelines for design, design, installation, verification, use and maintenance
3. SIST-TS CEN/TS 54-32 Fire detection, fire alarm and alarm systems - Part 32: Design, design, installation, verification, use and maintenance of fire alarm systems;
4. SIST EN 81-72 Safety rules for the construction and installation of lifts - Particular applications for passenger and goods passenger lifts - Part 72: Lifts for firefighters,
5. SIST EN 81-73 Safety rules for the construction and installation of lifts - Particular applications for passenger and goods passenger lifts - Part 73: behaviour of lifts in the event of fire,
6. SIST EN 81-76 - Safety rules for the construction and installation of lifts - Particular applications for passenger and goods passenger lifts - Part 76: Use of personal lifts for the evacuation of disabled persons,
7. SIST EN 179 Building hardware - Emergency escape devices with lever lever or push pedal for escape routes - Requirements and test methods,
8. SIST EN 1021-1 Furniture — Determination of ignitability of upholstered furniture — Part 1: Ignition source: a smoky cigarette,
9. SIST EN 1021-2 Furniture — Determination of ignitability of upholstered furniture — Part 1: Ignition source equivalent to match flame,
10. SIST EN 1125 Locks and fittings - Horizontal push bar closures for panic exits - Requirements and test methods,
11. SIST EN 1363-1 Fire performance tests — Part 1: General requirements

[2] References or references to codes of standards and other non-yearly standardisation deliverables shall be made in accordance with their most recent edition.

12. SIST EN 1364-3 Fire resistance tests for non-load-bearing elements - Part 3: Suspended façades - Full façade,
13. SIST EN 1364-4 Fire resistance tests for non-load-bearing elements - Part 4: Suspended façades - Partial façade,
14. SIST EN 1364-6 Fire resistance tests for non-load-bearing elements — Partitions in open state,
15. SIST EN 1634-1 Tests for fire resistance and smoke-tightness of doors, shutters and windows opening and elements of building hardware - Part 1: Fire resistance test for doors, closures and opening windows,
16. SIST EN 1634-3 Tests for the reaction-to-fire performance of doors and other interlocking assemblies – Part 3: Smoke doors and locks,
17. SIST EN 1838 Lighting - Emergency lighting,
18. SIST EN 1991 Eurocodes standard group 1: Effects on structures,
19. SIST EN 12101 Group of standards: Smoke and heat control systems,
20. SIST EN 12259 Group of standards: Fixed fire extinguishers — Parts of sprinklers and spray water systems, individual parts,
21. SIST EN 12845 Group of standards: Fixed fire-extinguishing systems — Automatic sprinkler systems,
22. SIST EN 13200 Group of standards - Spectator rooms,
23. SIST EN 13501 Group of standards - Fire classification of construction products and building elements,
24. SIST EN 13637 Building hardware - Electrically controlled exit systems for escape routes - Requirements and test methods,
25. SIST EN 13964 Suspended ceilings - Requirements and test methods
26. SIST EN 13830 Suspended facades - Product standard - AC correction
27. SIST EN 14637 Locks and fittings - Electrically controlled open fire/smoke systems for doors - Requirements, test methods, use and maintenance,
28. SIST EN 14470-1 Refractory chemical storage cabinets - Part 1: Fireproof cabinets for storing flammable liquids,
29. SIST EN 14470-2 Fireproof cabinets - Part 2: Fireproof cabinets for storing gas cylinders under pressure,
30. SIST EN 14175 Series of standards: Digesters,
31. SIST EN 14716 Tensioned ceilings — Requirements and test methods
32. SIST EN 15423 - Ventilation of buildings - Fire safety measure for air distribution systems in buildings,
33. SIST EN 15650 - Ventilation of buildings - Fire dampers in air installations,
34. SIST EN 15715:2010 Thermal insulation products — Installation and fixing instructions for reaction-to-fire tests — Factory-made products
35. SIST EN 16282-7: Equipment for professional kitchens - Components for ventilation of kitchens - Part 7: Installation and operation of fixed fire-extinguishing systems
36. SIST EN 16985 - Cabins for the application of organic coatings - Safety requirements
37. SIST EN 50171 Central safety power supply systems,
38. SIST EN 50172 Emergency lighting systems for escape routes,
39. SIST EN 50849 Electroacoustic emergency warning systems,
40. SIST EN 50575 Electrical power, control and communication cables - Cables for general purpose construction works according to the requirements for fire resistance,
41. SIST EN 60118-4 Electro acoustics - Hearing aids - Part 4: Induction loop systems for hearing aids - System requirements,
42. SIST HD 60364-4-42 Low-voltage electrical installations - Part 4-42: Protective measures - Protection against thermal effects,
43. SIST HD 60364-5-52: Low-voltage electrical installations - Part 5-52: Selection and installation of electrical equipment - Installation systems,
44. SIST EN 60598-2-22 Luminaires — Particular requirements — Luminaires for emergency lighting,
45. SIST EN IEC 61936-1:2021 - Electrical power plants for alternating voltages above 1 kV and DC voltages above 1,5 kV - Part 1: AC voltage,
46. SIST EN IEC 62485-1: - Safety requirements for secondary batteries and battery devices - Part 1: General safety information
47. SIST EN ISO 7010 Graphic symbols - Safety colours and safety signs - Registered safety signs,
48. SIST 1007 Marking plates for hydrants,
49. SIST 1186 Floor Tactile Leading System for Blind and Visually Impaired
50. SIST EN ISO 13943 Fire safety - Dictionary
51. ISO 6707-1 Buildings and civil engineering - Dictionary,

52. SIST ISO 8421-1 Fire protection - Dictionary - Part 1: General terms and occurrences in case of fire,
53. SIST ISO 8421-2 Fire protection - Dictionary - Part 2: Fire protection of structures,
54. SIST ISO 8421-6 Fire protection - Dictionary - Part 6: Evacuation and means of withdrawal,
55. ISO 21542 Construction of buildings - Accessibility and usability of the built environment,
56. DIN 14461-2 Fire-fighting - Pipeline coupling devices - Part 2: Water-extinguishing inlet and outlet installations, Feuerlösch-Schlauchanschlusseinrichtungen - Teil 2: Einspeiseeinrichtung und Entnahmeeinrichtung für Löschwasserleitungen "trocken",
57. DIN 14462-1 Design, installation, operation and maintenance of wall hydrant systems, overhead and underground hydrant systems and dry fire water systems, Planung, Einbau, Betrieb und Instandhaltung von Wandhydrantenanlagen, Über- und Unterflurhydrantenanlagen sowie Löschwasseranlangen "trocken",
58. DIN 14463-1 Water-based extinguishing systems - Remotely controlled charging and discharge stations - Part 1: For wet/dry quenching aqueducts, Löschwasseranlagen - Fernbetätigte Füll- und Entleerungsstationen - Teil 1: Für Löschwasserleitungen "nass/trocken",
59. DIN 18230-1 Fire safety in the construction of industrial facilities, Part 1: Computing required fire resistance, Baulicher Brandschutz im Industriebau - Teil 1: Rechnerisch erforderliche Feuerwiderstandsdauer,
60. DIN 18232-2 Smoke and heat control — Part 2: Natural heat dissipation devices; requirements, dimensioning, Rauch- und Wärmefreihaltung - Teil 2: Natürliche Rauchabzugsanlagen (NRA); Bemessung, Anforderungen und Einbau,
61. DIN 18232-5 Smoke and heat control — Part 5: Mechanical heat dissipation devices; requirements, dimensioning, Rauch- und Wärmefreihaltung - Teil 5: Maschinelle Rauchabzugsanlagen (MRA), Anforderungen, Bemessung,
62. ÖNORM H 6031 Ventilation equipment - Installation and control of fire and smoke dampers, Lüftungstechnische Anlagen - Einbau und Kontrollprüfung von Brandschutzklappen und Brandrauch-Steuerklappen
63. DIN 14230 Underground fire-fighting water tanks; Unterirdische Löschwasserbehälter
64. BS 7346-7 Components for smoke and heat control systems, Code of practice on functional recommendations and calculation methods for smoke and heat control systems for covered car parks.

0.2.3 Guidelines and other documents[3]

1. Technical Guideline for the Construction of TSG-N-002:Low Voltage Electrical Installations
2. Technical guideline for the construction of TSG-N-003: Protection against lightning,
3. Spatial technical guideline TSG-12640-002: Health buildings;
4. Guideline CNGV 204 Fire safety deviations between buildings,
5. SZPV Guideline 206 Surfaces for firefighters adjacent to buildings,
6. SZPV Guideline 208: Buildings with double facades,
7. SZPV Guideline 209: Buildings with atriums and inner courtyards
8. Guideline SZPV 210: Storage of hazardous substances,
9. SZPV Guideline 211: Demonstration of correct implementations of fire separations,
10. SZPV IZS Guideline 304: commercial buildings,
11. Guideline SZPV IZS 307: The collection points,
12. Guideline SZPV IZS 308: Industrial buildings;
13. SZPV Guideline 310: The tall buildings,
14. SZPV Guideline 311: Special requirements for garages,
15. SZPV Guideline 403: Control in case of fire,
16. SZPV Guideline 405-1: Natural Smoke and Heat Discharge (NODT) devices
17. SZPV Guideline 405-2: Natural smoke evacuation from staircases (NODS),
18. Guideline CNGV IZS 406 Ventilation systems,
19. SZPV Guideline 407: Fire safety in the design, installation and use of combustion and smoke systems,
20. SZPV Guideline 408: Fire safety requirements for electrical and piping installations in buildings;
21. SZPV Guideline 401: Use of the lift in case of fire,
22. SZPV Guideline 412: Use of combustible/non-combustible building materials,
23. SZPV Guideline 413: Requirements for automatic doors in escape routes,

[3] The websites of the issuers on which data on valid issues of documents are published are listed. Those editions were in force at the time of drafting the proposal for this guideline, in March 2025.

24. SZPV Guideline 414: Wooden constructions of buildings,
25. SZPV Guideline 415: Construction of fire-resistant buildings with sandwich panels with double-sided metal lining,
26. SZPV Guideline 416: Door equipment on evacuation routes,
27. SZPV Guideline 417: Electrical energy storage units,
28. CNGV Guideline 512 Fire safety of solar power plants;
29. CFPA-E Guideline 7 Safety distances between waste containers and buildings,
30. CFPA Guideline E No 32 Treatment and storage of waste and combustible secondary raw materials;
31. IZS Guideline MST-13, Firewater Capture Guideline.
32. TRVB S 125 Smoke and heat extractors, Rauch- und Wärmeabzugsanlagen und Rauchableitungsanlagen,
33. DVGW TRGI Technical guidelines for gas installations of the German Association,
34. DVFG TRF Technical guidelines for liquefied petroleum gas installations of the German association Technische Regeln Flüssiggas TRF 1996,
35. DGUV 206-046: Painting rooms and facilities for liquid coating materials - Structural facilities, fire and explosion protection, operation, Lackierräume und -einrichtungen für flüssige Beschichtungsstoffe - Bauliche Einrichtungen, Brand- und Explosionsschutz, Betrieb,
36. VdS 2815 Interaction of water-based fire-fighting systems with smoke and heat extraction, fire safety instructions, Zusammenwirken von Wasserlöschanlagen und Rauch- und Wärmeabzugsanlagen (RWA) - Merkblatt zum Brandschut,
37. VdS 2095 Automatic fire alarm systems, design and installation, Automatische Brandmeldeanlagen, Planung und Einbau,
38. VdS CEA 4001 Sprinkler Systems Design, Sprinkleranlagen, Planung und Einbau,
39. CEA 4001 Sprinkler Systems Planning,
40. VDS 3188, Water Mist Sprinkler Systems and Water Mist Extinguishing Systems (High-Pressure Systems)
41. NFPA 13, Standard for the Installation of Sprinkler Systems
42. NFPA 750, Standard on Water Mist Fire Protection Systems
43. FM global guidelines, DS 4-2, Water mist systems
44. FM Global Guidelines, DS 2-0, Installation Guidelines for Automatic Sprinklers
45. VdS 2032 Fire protection of cold stores and freezers, Brandschutz für Kühl- und Tiefkühllager,
46. CEA 4050 Specifications for the protection of cold areas
47. VDI 3564 Recommendations for fire safety in high bay storage (VRS), Empfehlungen für Brandschutz and Hochregalanlagen, http://www.vdi.de/,
48. VDI 6017 Guideline Lifts - control in case of fire, Aufzüge - Steuerung für den Brandfall,
49. VdS 2807 Fire extinguishing systems in commercial kitchens, Löschsysteme and gewerblichen Küchen
50. DIN VDE 0833 standard group: Fire, burglary and robbery alarm systems; Gefahrenmeldeanlagen für Brand, Einbruch und Überfall
51. VdS 3856 - Sprinkler system for lithium-ion batteries, Sprinklerschutz von Lithium-Batterien
52. Technical guideline Approved document B – Volume 2 – Buildings other then dwelling houses,

The CNG Guidelines are available at www.szpv.si, the CFPA Guidelines at www.cfpa-e.eu, the VDS Guidelines at https://shop.vds.de/ and the VDI Guidelines at https://www.vdi.de/.

0.3 MEANING OF TERMS

(1) Terms in the field of building construction that are not defined in this technical guideline are defined in the regulations on building construction or in the standard SIST ISO 6707-1 and SIST ISO 9836 or the regulation replacing it.

(2) Fire safety terms that are not defined in this technical guideline are defined in the fire protection regulations or in the SIST ISO 8421 series of standards.

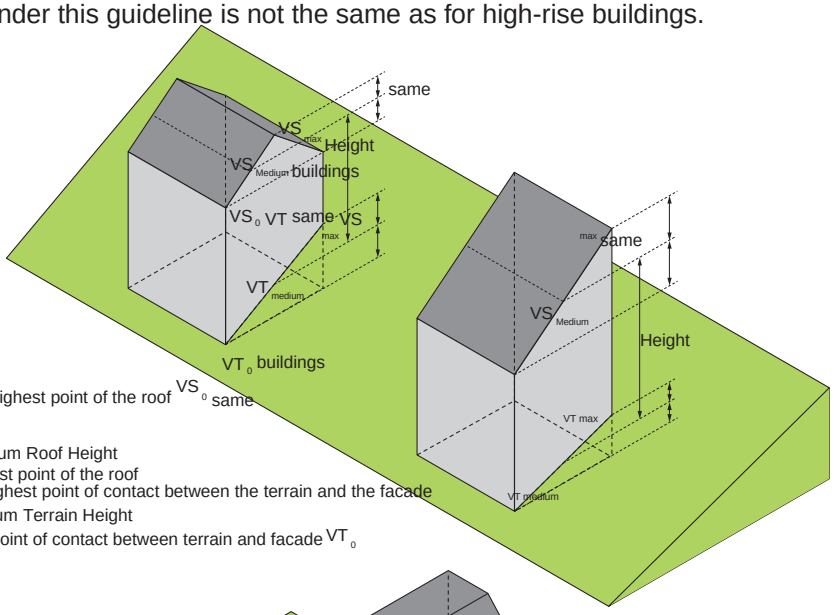
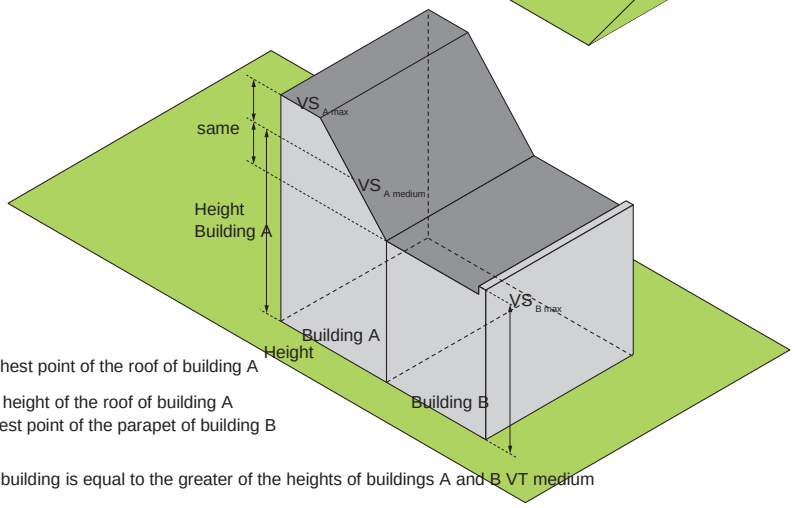
Short title	**Description**
Automatic fire detection, fire alarm and alarm system	A fire alarm system that automatically detects a fire, activates the fire alarm and triggers other intended measures.
Atrium, atrial building	An atrial building is a building with a covered space (atrium) inside the building, which passes through several floors. See also the term “indoor courtyard”.

Automatic mechanical garage	Garage without driving paths, which users do not enter. From the entrance point, motor vehicles are transported to the parking space using mechanical transport devices.
Smooth doors	Doors with required smoke resistance according to SIST EN 1634-3 Tests for fire resistance of doors and other interlocking assemblies – Part 3: Smoke doors and locks.
Level A Elevator	A level A lift (according to CNG 410/VDI 6017) is understood to be a lift where, in the event of a fire alarm, it is not possible to extend the operation of the lift and, in the event of a fire alarm, the lift is controlled via the fire control station in such a way that it is immediately taken to the exit floor.
Level B Elevator	Level B lift (according to CNG 410/VDI 6017) is understood as a lift where, in the event of a fire alarm, it is possible to extend the operation of the lift until a critical event. After a critical event, in the event of a fire alarm, the elevator is controlled via the fire control station in such a way that it is immediately taken to the exit floor.
Evacuation Elevator	A lift which may, under normal conditions, be intended for the transport of persons and fitted with additional protective equipment, control and signalling devices, so that it can be used in fire for the purpose of evacuating persons with reduced mobility. It may be managed by persons qualified to carry out evacuation (CNG 410/VDI 6017 level C).
Firefighter Elevator	Lift which may, under normal conditions, be intended for the transport of persons and fitted with additional protective equipment, control and signalling devices, so that it can be operated and used by firefighters during fire-fighting and rescue operations (CNG 410/VDI 6017 level D).
Static fire control lifts	Static fire control of the lift is a control in which the level at which the lift will stop in the event of a fire alarm is predetermined. For further explanations, see CZPV 410/VDI 6017.
Elevators with extended static fire control	Extended static fire control of a lift is a control in which the level in which the lift will stop in the event of a fire alarm is predetermined and protected by a smoke detector. If a fire is detected on a predetermined level, the fire station changes the target level that was predetermined. Usually, this is a floor above the original designated floor. For further explanations, see SZPV Guidelines 410 and VDI 6017.
Lifts with partially dynamic fire control	Partially dynamic fire control of the lift is a control that is not as capable as dynamic. In the case of partially dynamic lift control, the rule is that if a fire is detected on the floor to which the lift is to be driven, the fire control unit changes the target floor. Usually this is the floor above the floor where the elevator was intended.. For further explanations, see SZPV Guidelines 410 and VDI 6017.
Dynamic fire control lifts	The dynamic fire control of the lift is a control in which the level at which the lift will stop in the event of a fire alarm is not predetermined and can be changed. It is determined by the presence of smoke or fire in the rooms connected to the elevator. For further explanations, see SZPV Guidelines 410 and VDI 6017.
Effective surface area of the NODT; aerodynamic surface of NODT	This is the area calculated by multiplying the geometric area of the orifice by the flow coefficient (c_V) for the particular orifice.
Easy way to power up	Power supply only from the public network, no generator or batteries, with a special connection in front of the main switch of the building.
Evacuation Path, Retreat Path	Path through which it is possible to withdraw from any point in the building to the exit to a safe place.
Evacuation sector	This is a set of spaces, fire sectors or a wider area, which are at the same time areas of simultaneous alarm, where evacuation is organized and controlled.
Gallery	The gallery is an additional, walkable level inside the room. The area of the gallery is smaller than the area of the room and can occupy up to 50% of the area of the room.
Firefighting water	Firefighting water is water used for extinguishing.
Geometrical area of openings for NODT	The product of the bright width/light height of the opening and the perpendicular distance from the edge of the groove parallel to the axis of rotation to the plane of the open wing.
Combustible building materials	Combustible building materials are those that ignite under prescribed test conditions. According to their contribution to the development of fire, they are divided into heavy-

	combustible (A2-s2,d1, B and C) and normal-combustible (D and E). Highly flammable Class F products shall not be used in construction.
Depth of building	The depth of the building is measured from the pressure angle of the lowest floor to the highest point of the polished terrain.
Economic space	A space such as a convenient warehouse, a technical space, a space for cleaners and cleaning equipment, a food and kitchen inventory, a storage room for inventory and other equipment, a wardrobe of replacement clothing and footwear or toilets for employed staff (up to 5 persons) or a convenient archive where employees or external contractors only occasionally stay.
Horizontal evacuation	Evacuation from the endangered fire sector to the adjacent fire sector at the same level, from which safe escape to the open air is ensured. It is carried out in buildings where a large number of users with restrictions are staying or staying, due to which they need special assistance when withdrawing (hospitals, homes for the elderly, etc.). The length of the escape route shall be measured from the farthest point of the space to the protected stairway or exit to a safe place.
Exit to a safe place	This is the exit from the building to the open air, from which a safe path leads to a safe place or a meeting point. A safe pathway is a pathway that leads away from a building and does not pass through narrow passageways or bypass fire-resistant openings such as windows or doors.
Mechanical smoke and heat extraction	Smoke and heat control with machine devices.
Border elements of the fire sector	Elements that divide a building into several separate fire sectors, e.g. firewall, fire ceiling, fire door, fire damper.
Pressure control of smoke	Prevent the ingress of smoke and heat from the part of the building that is at risk of fire into the protected part of the building with excess pressure.
Overhead garage	A garage or garage floor whose floor in the middle of the garage is not more than 1.3 m on average below the level of the terrain or at least on one facade entirely at or above the level of the terrain.
The shopping street	Shopping streets are areas with a roof or ceiling, next to which there are shops; They are intended for customer traffic. (see SZPV Guideline 312).
Natural smoke and heat extraction	Built-in devices connected to a system that effectively discharges smoke and hot flue gases outdoors in a fire by buoyancy of warm or hot flue gases.
Non-combustible building materials	They are building materials which, under the prescribed test conditions, cannot burn and do not contribute to the development of fire. These are materials of class A1 and A2-s1,d0 according to SIST EN 13501-1. The non-combustibility of certain products does not need to be demonstrated by testing. They are listed in Commission Decision 96/603/EC.
Fixed fire load	Fixed fire load is the sum of the thermal energy of all combustible materials contributing to the fire inside the building (e.g. load-bearing structure, core of combustible panels, wooden structure of landings, combustible electrical installations, combustible machinery installations including insulation, room linings, roof insulation, etc.).
Inner courtyard	It is a space that is surrounded on all sides by the walls of the building and is not covered with a roof (see also the atrium).
Lining of interior walls	Internal, vertical or almost vertical non-carrying lining of the load-bearing structure or internal walls. Balancing mass, paint and other linings up to a thickness of 1 mm shall not be considered as linings.
Lining of external walls (facade)	External, vertical or almost vertical non-carrying lining of the supporting structure or external walls.
Open garage	Overhead garage, which has at least 1/3 of the total wall area openings directly to the open air and cannot be closed; openings are evenly distributed throughout the entire side of the garage, the distance between these openings in opposite walls is not more than 70 m. All openings are above the level of the terrain, the height of the terrain is taken as the average of the height of the terrain at a distance of 10 m from the facade. There shall be

	no obstructions in front of the openings to prevent ventilation and ODT.
Smoking apertures	Openings in façades, roofs, shafts, canals (including windows and doors), which lead directly to the open air and also allow natural smoke extraction or smoke extraction by mobile fans.
Drainage of smoke and heat	Controlled discharge of smoke and heat from the building in a fire to the open air.
Respond of building materials to fire	Characteristics of building materials, representing their behavior in a fire. Based on the tests, they are classified according to the SIST EN 13501-1 standard.
Supporting guidelines	The supporting guidelines are those referred to in this technical guideline TSG-1-001 and referred to in point 0.
Surfaces for firefighters next to the building	Surfaces for firefighters adjacent to the building are areas for access of firefighters and fire-fighting vehicles to the building on the building plot or on public traffic areas around the building. The fire-fighting areas adjacent to the building include access routes for fire-fighters, access routes for fire-fighting vehicles and installation and work areas for fire-fighting vehicles.
Fire hazard	For the definition of fire hazard, see the table of the Rules on the selection and installation of fire extinguishers.
Fire load	Fire load (including fire load) is the amount of heat of all combustible materials in a room distributed on its surface and is expressed in MJ/m^2. It is presented as the sum of fire loads of mobile and stationary combustible materials. Excluded are materials which are installed, processed or stored in a form which prevents the ignition of these materials and which are fire-separated from the spaces. We distinguish between the following levels of fire load: - very low fire load: up to 250 MJ/m^2, - low fire load: 250 to 500 MJ/m^2, - mean fire load from 500 to 1000 MJ/m^2, - heavy fire load from 1,000 to 2,000 MJ/m2, - very high fire load: more than 2,000 MJ/m2.
Fire control of lifts	The fire control of the lift may be an integral part of the AJP system or a separate control unit which is properly connected to the lift control, or an integral part of the lift control with an appropriate connection to the actuating device. A distinction is made between static, extended static, semi-dynamic and dynamic fire control of the lift (see CNGV guideline 410 and VDI 6017).
Mobile fire load	The reference values for specific fire loads shall be determined by calculation or the declared values shall be used. The following documents help to determine the specific fire load: TRVB A 126, SIST EN 1991-1-2 and DIN 18230-1. Where data cannot be obtained, VKF 115-03 or SIA 81 documents may exceptionally be used.
Ventilated façade	A ventilated façade is a façade that has an air layer up to a few centimeters wide between the outer lining and the insulation.
Firewall; firewall	The part of the structure of the building which delimits the space or spaces and which has the required fire resistance.
Fire doors	Doors with required fire resistance according to SIST EN 13501-2, Fire classification of construction products and building elements - Part 2: Classification based on data from fire resistance and/or smoke test, except ventilation devices. The method of testing is carried out according to the standard SIST EN 1634-1, Fire resistance and smoke resistance tests of doors, shutters and windows that open, and building hardware elements - Part 1: Fire resistance test for doors, closures and opening windows.
Firewater	Firefighting water remaining in the burnt area after extinguishing.
Fire properties of elements of building structures	Characteristics of elements of building structures, representing their behavior in a fire.
Fire performance of floor coverings	Characteristics of the floor coverings, representing their behavior in the fire. Based on the tests, they are classified according to the SIST EN 13501-1 standard.
Fire properties of roofing	Characteristics of roof coverings, representing their resistance to fire from the outside. On the basis of the tests, they are classified according to the standard SIST EN 13501-5.

Fire aerator	A fire aerator is an element of the NODT system that closes the opening in the closed position, and in a fire allows natural extraction of smoke and heat through the roof or wall of the building.
Fire sector	A fire sector is an assembly of one or more spaces in a building from which, due to a firewall or a wall, a fire cannot spread to adjacent fire sectors for a certain period of time.
Space for a large number of users (100 or more)	Space with a total number of users of 100 or more in catering buildings (CC-SI 121), other administrative and office buildings (CC-SI 12203), commercial and other buildings for service activities (CC-SI 123), stations and terminals (CC-SI 1241), buildings of general social interest (CC-SI 126), buildings used for religious services (CC-SI 12721) and buildings of other classifications, the individual parts of which serve the same purpose as those buildings. It also applies to buildings of the above-mentioned classifications, where more than 100 people can gather in several smaller rooms and use the same unprotected fire escape route (e.g. the same corridor, staircase).
Extinguishing systems	Liquid, gaseous or powder fire-extinguishing systems which must be designed and installed in accordance with the standards or other technical specifications laid down by building regulations.
Specific fire load	Sum of stationary and mobile fire load per unit floor area of the fire sector, expressed in MJ/m^2.
Double façade building	Building that has additional (glass) facades due to aesthetic or air-conditioning requirements or due to sound insulation. The gap between the outer and the inner facade can be from a few centimeters to a few meters.
Staircase	Vertical communication footpath. The staircase can be internal (protected or unprotected), external (protected) or security.
Number of users	Anticipated maximum number of users who could stay in the whole building or in the premises of a part of the building forming one fire sector at the same time.
Thermoplastic material	It is a non-circuit polymeric material that becomes soft and melts at elevated temperatures. Due to the high temperature (>350 °C) or in the presence of a flame, it ignites and drips burning. In case it spills on the floor, it burns like a liquid.
A safe city	A place outdoors, on adjacent or public land outside the building, where the building users are not threatened by fire.
Security lighting	Lighting that, in the event of a failure of general lighting, allows users to see exit signs, the direction of the escape routes and the escape route.
The tall building	A building that has a floor height of the last floor in which users can stay, more than 22 m above the level of the terrain, where a working or lay surface for fire-fighting vehicles is provided.

Height of building	The height of a building is measured from the middle height of the angle of the polished terrain touched by the building to the middle height of the roof structure. Examples of determining the height of buildings with varied gabarites and different heights of facades are shown in the drawing below. The height of a building under this guideline is not the same as for high-rise buildings.  VS max - The highest point of the roof VS 0 same VS Medium - Medium Roof Height VS 0 - The lowest point of the roof VT max - The highest point of contact between the terrain and the facade VT Medium - Medium Terrain Height VT 0 - Lowest point of contact between terrain and facade VT 0  VS A max - The highest point of the roof of building A VS A medium - Middle height of the roof of building A VS B max - The highest point of the parapet of building B The height of the building is equal to the greater of the heights of buildings A and B VT medium
High-bay warehouse	Warehouse with storage height - the upper edge of the stored material, more than 7.5 m.
Closed garage	Garage that does not qualify for an open garage.
Protected part of the escape route	The part of the escape route that is fire-separated from the rest of the building.
The Protected Corridor	The horizontal part of the escape route, which is fire-separated from the rest of the building, constitutes a safe part of the escape route and leads directly to the exit to a safe place or to a protected staircase.
Protected staircase	A staircase inside or outside a building that is fire-separated from the rest of the building and constitutes a safe part of the escape route.
Meeting point	A space or several smaller spaces with a total number of users of 200 or more using the same fire unprotected escape route (e.g. same corridor, staircase). At the same time, the space should also correspond to the definition of space for a large number of users.
Meeting point	It is the end point of the outdoor evacuation where the users of the facility gather.

0.4 SHOWS

For the purposes of this Guideline, abbreviations shall have the following meanings:

Abbreviation	**Description**
AJP	automatic fire detection, fire alarm and alarm system
APZ	Active fire protection
AGS	automatic fire-fighting system
BHEE	battery storage
BTP	Gross floor area
VRS	high bay storage
CFD	Computer simulation of material flows. Computer Fluid Dynamics
CNG	Compressed natural gas
ENS	Electroacoustic emergency warning systems
EPS	expanded polystyrene
ETICS	contact facades with thin-layer plaster External Thermal Insulating Contact System)
HEE	electricity storage
LNG	liquefied natural gas
MODT	Mechanical extraction of smoke and heat
NH	internal hydrant
NKD	overpressure smoke control
NODT	Natural extraction of smoke and heat
ODT	Drainage of smoke and heat
PIR	Polyisocyanurate (polyisocyanurate foam)
PUR	Polyurethane (polyurethane foam)
tt	a record indicating the time criterion of the duration of the fire protection, which may be 30, 60, 90 or 120 minutes
SAPZ	active fire protection system
VR	Security lighting
LPG	LPG
XPS	extruded polystyrene

1. Enlarging the fire at the meeting venues

Article 3

Spread of fire to neighboring buildings

(1) The exterior walls and roofs of buildings must be designed and built in such a way as to limit the spread of fire to neighbouring buildings by taking into account their deviation from the boundaries of the plot.

(2) Separation walls, together with doors, windows and other breakthroughs between individual buildings, must be designed and built in such a way as to limit the spread of fire to adjacent

1.1 INTRODUCTION

(1) The transfer of a fire from a burning building to neighbouring buildings depends on the thermal radiation, the size of the surface through which the fire radiates heat to the surroundings, the distance between the building and the neighbouring buildings, and the presence of combustible materials on the outer walls of potentially endangered buildings or the size of unprotected surfaces through which the fire can be transferred to the neighbouring building. Fire can also be transmitted by flying flaming particles.

(2) The building must be designed in such a way that the fire in it cannot spread to neighbouring buildings, even if they were located at the parcel border. This is ensured by adequate fire protection of the façade and roof of the building and by moving the building away from the adjacent plot for at least as long as this requirement is met.

(3) Measures to prevent fire transmission to neighbouring installations under this Guideline shall be based on the following starting points:

1. The intensity of the fire depends on the size of the fire sector. A fire can cover the entire fire sector, but it must not spread beyond its borders.
2. The risk of fire and its intensity depend on the purpose of the building. They are reduced if an AGS is installed in terms of total protection.
3. Residential buildings and meeting places are more dangerous than other buildings. Thermal radiation through the fire-resistant wall can be ignored.

(4) If an adequate clearance between the building and the parcel boundary cannot be ensured, additional architectural and building measures must be applied. These are:

1. dividing the building into several fire sectors,
2. limiting the size and proportion of openings in the external walls or surfaces of the external walls of the building through which fire can be transmitted to neighbouring buildings (see point 1.3);
3. selection of appropriate materials and cladding of external walls and roofs. The relevant fire properties of these materials are described in points 1.3, 1.4 and 1.5;
4. installation of the sprinkler system.

(5) From the point of view of fire safety, the planned building must not affect the conditions for the construction, reconstruction or upgrading of buildings on adjacent land, unless there is a public road, railway, river or other natural barrier that permanently prevents construction. Therefore, the distance between the planned building and the relevant boundary is used to calculate the minimum distances

allowed (see point 1.2).

(6) Deviations do not need to be established from underground, ground-based or road-based facilities.

(7) Due to the impact of a possible fire in an adjacent building, it is necessary to check the appropriateness of the deviation also to buildings such as hayracks, warmers, silos.

1.2 THE RELEVANT BOUNDARY

(1) The relevant limit is the line from which the required deviations of the building are measured, i.e. it determines the maximum permitted share of non-fireproof surfaces of the outer wall. The relevant boundary is the boundary of the neighbouring plot of another owner, the apparent boundary between buildings, but it can also be the middle of a public road, railway, river or other natural obstacle that permanently prevents construction (see drawings 1a and 1b).

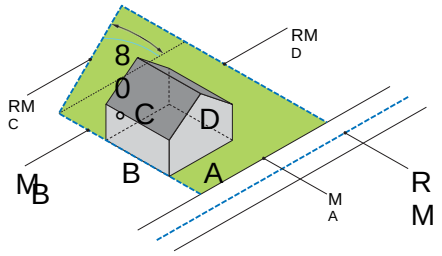
Example: A neighbouring plot of land of another owner can be a meadow, agricultural land or forest. Natural barriers that prevent construction include abysses, lakes, rivers, etc. …

(2) The deviations between the building and the buildings on the same plot (or plots of the same owner) are determined by the deviations of the building from the virtual border. The existing building on the same plot sets a virtual boundary. The location of a new building shall be determined in such a way that the virtual boundary represents the relevant boundary for the new building.

(3) The relevant limit is that (see drawing 1a and 1b):

1. coincide with the outer wall of the building, or
2. be parallel to the outer wall of the building; or
3. be at an angle of <80° to the outer wall of the building.

Recommendation: If an existing building on a neighbouring plot of land of another owner does not have a sufficient distance from the plot boundary or has an excessive share of fire-resistant areas, it is recommended to calculate the distance from the apparent boundary determined by the existing building. This virtual boundary becomes the relevant boundary for the new building (see drawing 1b).



M_A - Boundary parallel to wall A

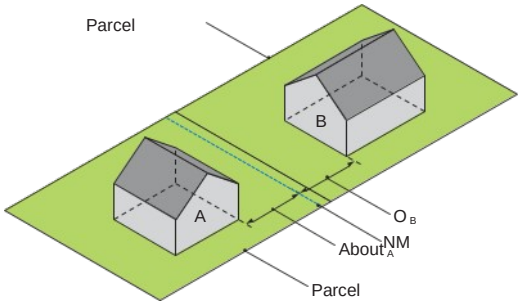
M_B - The boundary of the plot is the relevant boundary for wall B because it coincides with wall B

RM_C - Relevant boundary for wall C, because the angle between wall C and the boundary of the plot is less than 80º.

RM_D - Relevant boundary for wall D, because it is parallel to it.

RM - The relevant boundary is the middle of the road, railway or river.

Drawing 1a: Relevant boundary



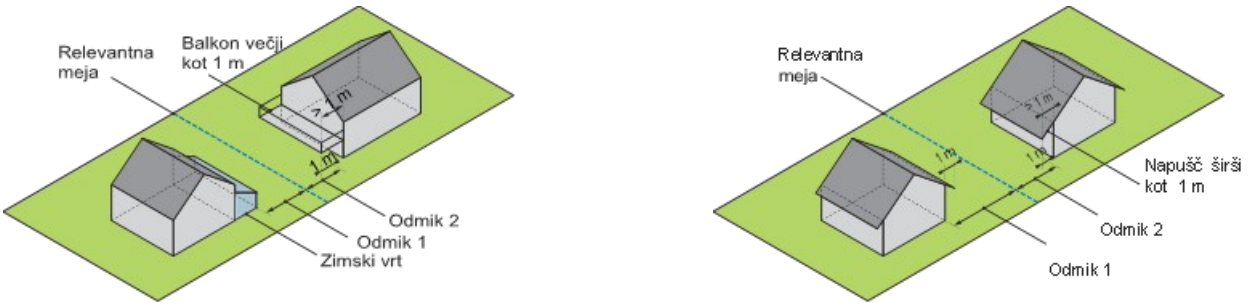
A - The new building
B - Existing facility
O_A - Deviation in accordance with the requirements for the deviation of the relevant boundary from object A.
O_B - Deviation compliant with the requirements to deviate the relevant boundary from Object B.
NM - Virtual boundary determined on the basis of requirements to deviate the relevant boundary from existing object B (same owner)

Drawing 1b: Relevant and virtual boundary

(4) The deviation from the relevant boundary is measured from the outer layer of the facade of the building. A canopy, an open balcony or an roof that is not more than 1 m wide and its outer edge is more than 2 m away from the relevant border does not affect the calculation of the distance of the building from the relevant border or the calculation of the share of fireproof areas. If such a projection is greater than 1 m, the part of that projection exceeding 1 m shall be added to the calculated deviation of the facade from the relevant boundary (e.g. for a balcony of 1,7 m width, 0,7 m shall be added).

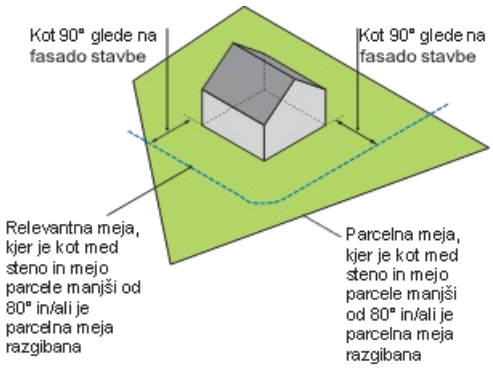
(5) Where the outer edge of a canopy, an open balcony or an eaves extends closer than 1 m to the relevant boundary, the part of the outer wall below the canopy, open balcony or eaves shall not have the fire-proof surfaces specified in the seventh paragraph of point 1.3. Apertures complying with the eleventh paragraph of point 1.3 are permitted.

(6) If the balcony or loggia is closed (including a winter garden), the most exposed line of the balcony or loggia is considered to be the line of the outer layer of the facade of the building (see drawing 2).



Drawing 2: Influence of a winter garden, an open balcony and a drift away from the relevant border

(7) Where the parcel boundary is at an angle of less than 80° to the external wall of the building and/or the parcel boundary is varied, the offset shall be determined in such a way as to establish a parallel to the façade and to take into account, for the offset, the minimum distance perpendicular to the façade of the building reaching the parcel boundary as shown in drawing 3.



Drawing 3: Determination of the deviation from the relevant limit where the relevant limit is at an angle of less than 80°

1.3 SAFETY RESPONSIBILITY OF EXTERNAL BUILDINGS AND SHORTLY UNPROTECTED SURFACE

(1) The outer wall of a building shall comply with the fire protection requirements regarding the possibility of fire spreading between buildings if it has the same fire resistance as required for the fire resistance of the boundaries of the fire sectors according to point 2.3, but at least as much as required by this point. In doing so, we take into account a higher requirement.

(2) If the planned building is located at a distance of less than 1 m from the relevant boundary, the external wall on both sides (external and internal) shall have a fire resistance of at least REI 60-M, or as set out in Tables 7 and 8 if the requirements are higher. Materials for the facade should be non-combustible.

(3) If the deviation from the relevant limit is 1 m or more, the internal fire resistance of the external wall shall be at least RE 30 or at least as set out in Tables 7 and 8, taking into account the RE class. Unprotected areas must not exceed the values laid down in point 1.4.

(4) If the deviation of the building from the relevant boundary is greater than the height of the external wall and greater than 10 m, there are no requirements for the fire resistance of the external wall against the relevant boundary. For buildings protected by a sprinkler system in terms of total protection, this clearance may be at least half the height of the outer wall or at least 5 m. The height of the outer wall shall be measured from the level of the terrain to the contact between the wall and the roof. For roofs with a slope of more than 45º and less than 70º, one third of the roof height must be added to the wall height. If the slope of the roof is greater, the total height of the roof is added to the height of the wall.

(5) In fire-resistant exterior walls, non-fire-resistant surfaces complying with the provisions of this point shall be permitted. The non-fire-resistant surfaces of the external walls of a building are those which do not achieve the fire resistance referred to in the first to third paragraphs of this point.

(6) The non-fire-resistant surfaces of external walls include:

1. windows, doors and other openings with no or lesser reaction to fire than required in the first three paragraphs of this point;
2. any part of an external wall with a lower fire resistance than required in the first three paragraphs of this point;
3. roof area, if the roof slope is greater than 70º and the roof has a lower fire resistance than required for the outer wall;
4. any part of an external wall (the wall shall be fire resistant) which has a lining made of combustible material of classes B-s3,d2*, C, D or E, with a thickness of more than 1 mm.

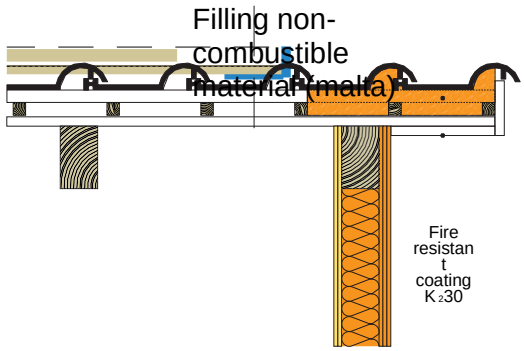
*Note: *Class B-s3,d2 material classification means that it is a Class B material for which there are no smoke release requirements and/or no restrictions on the dripping of flammable particles in the standard test procedure.*

(7) The exterior wall of a protected stairway with no or lesser fire resistance than required in the first four paragraphs of this point shall be at least 1 m from the relevant boundary.

(8) The surfaces of the external walls of the protected staircase shall not be taken into account as fire-proof surfaces (see drawing 5).

(9) If the external wall has sufficient fire resistance but has a lining of combustible material of classes B-s3,d2, C or D with a thickness of more than 1 mm on the external side, half of the surface of such a wall shall be considered as a fire-resistant area (see drawing 5).

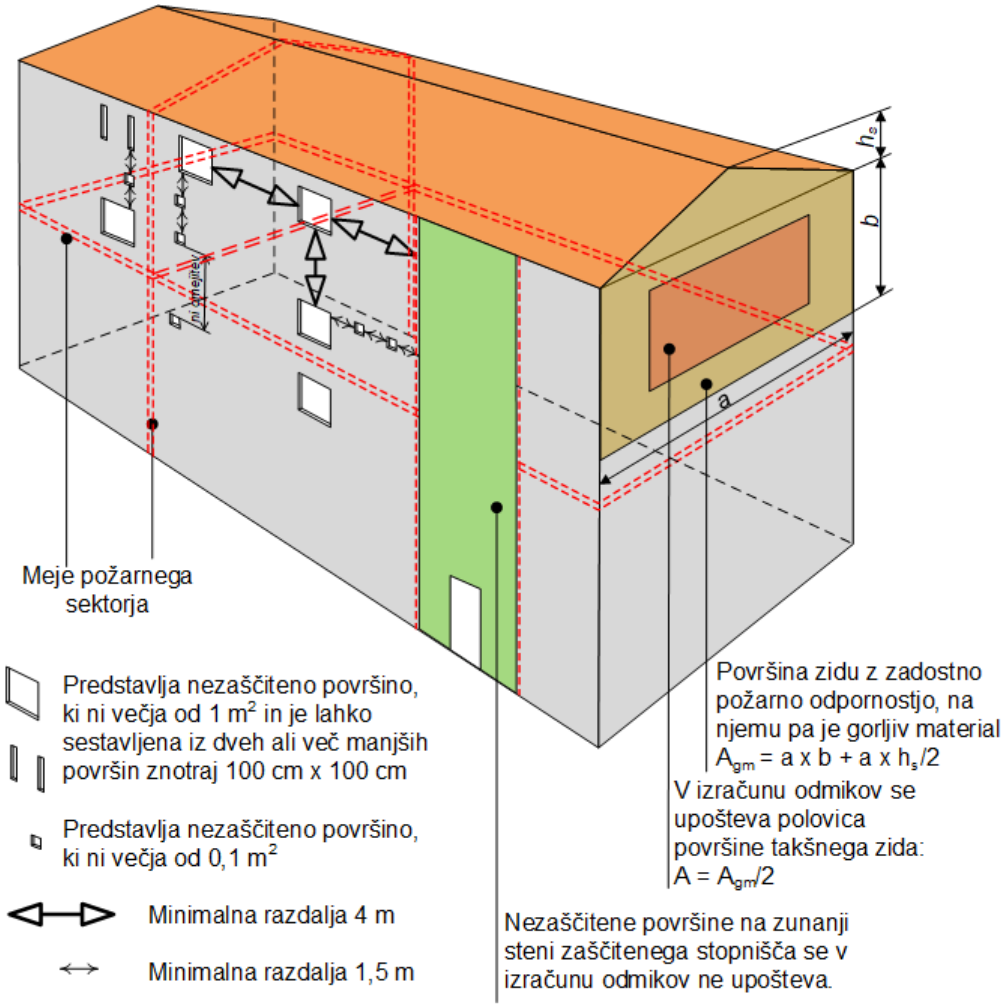
(10) If the deviation of the building from the relevant boundary is less than 1 m, the facade must consist entirely of non-combustible materials of classification A1 or A2-s1,d0. If the outer edge of a canopy, an open balcony or an opening extends closer than 1 m to the relevant boundary, the canopy, open balcony or roofing must be made of non-combustible materials. If it is made of combustible materials, it shall be lined with non-combustible fire-resistant materials of at least $K_{2}30$ (see drawing 4) or protected by non-combustible plates having a minimum thickness of 12,5 mm of Class A2-s1,d0 and a non-combustible finish in Class A1 or A2-s1,d0.



Drawing 4: The design of the fire-resistant lining is leaking.

(12) If the deviation of the building from the relevant boundary is less than 1 m and the fire load of the fire sector adjacent to this façade is less than 250 MJ/m^2, the following unprotected areas are permitted in this outer wall of this fire sector (see drawing 5):

1. fire-resistant surfaces of not more than 1 m x 1 m spaced more than 4 m apart,
2. fire-proof surfaces up to 0,1 m^2, separated by at least 1,5 m from other unprotected surfaces.



Drawing 5: Fire-resistant areas that do not need to be taken into account when calculating offsets.

1.4 METHODS FOR CALCULATING THE ACCEPTABLE PARTS OF UNPROTECTED SURFACE OF EXTERNAL STENS

(1) Three methods are used to calculate the proportion of areas not protected by fire or displacement, in accordance with the starting points described in point 1.1. They are ranked in terms of accuracy from the least to the most accurate. The least accurate and simple method is on the safest side and allows the least unprotected surfaces. The simpler methods are described in points 1.4.1 and 1.4.2.

(2) Simpler methods are not allowed if the density of unprotected areas is locally high. They are also not suitable for buildings where:

- unprotected surfaces are not evenly distributed over the entire surface of the facade casing,
- the unprotected surfaces are very distant from each other,
- the distance of the facade under consideration from the relevant boundary is not the same throughout its length.

A third method should be used for these cases.

(3) If the building is protected by a built-in full protection sprinkler system, the clearance from the relevant boundary may be halved, but shall not be less than 1 m. Instead of reducing the clearance, the proportion of fireproof areas may be doubled. This reduction in clearance or increase in unprotected areas can be taken into account in all three methods.

1.4.1 Calculation of deviation according to method 1

This method may only be used for residential buildings (CC-SI 11) located more than 1 m from the relevant

border. The building shall have a maximum of three floors and the facade towards the border shall not exceed 24 m in length. The maximum total fire protection area shall be determined depending on the minimum deviation according to Table 1. Intermediate values may be interpolated.

Table 1: Calculation of deviation according to method 1

Minimum deviation of the building from the relevant boundary [m]	Maximum total fire protection area [m^2]
Less than 1	in accordance with the twelfth paragraph of point 1.3
1	5,6
2	12
3	18
4	24
5	30
6	There are no restrictions

1.4.2 Calculation of deviation according to method 2

(1) This method may be applied to buildings or fire sectors within a building of any use, provided that they are more than 1 m from the relevant boundary and the gross floor area of the building is not more than 2 000 m^2. The building or fire sector must not be higher than 10 m, except in the case of open garage buildings.

(2) The minimum deviation from the relevant limit and the maximum total fire protection area are set out in Table 2. Intermediate values may be interpolated.

Table 2: Calculation of deviation according to method 2

Minimum deviation of the building from the relevant boundary [m] for CC-SI groups of buildings:		Maximum percentage of areas not protected by fire [%]
11 - Residential buildings 121 - Catering buildings 122 - administrative and office buildings 1242 - Garage buildings 125 - industrial buildings and warehouses (up to 500 MJ/m2) 126 - Buildings of general social interest 1272 - Religious buildings, cemetery buildings 1273 - Cultural monuments 1274 - Other non-residential buildings	123 - Commercial and other buildings for service activities 1241 - Station buildings, terminals, buildings for carrying out communications and related buildings 125 - industrial buildings and warehouses (above 500 MJ/m2) 1271 - Non-residential agricultural buildings	
-	1	4
1	2	8
2,5	5	20
5	10	40
7,5	15	60
10	20	80
12,5	25	100

N.B.: The maximum percentage of unprotected areas is obtained by dividing the sum of all unprotected areas in the wall by the area of the rectangle that covers them and multiplying by 100.

1.4.3 Calculation of deviation according to method 3

CNG 204 shall be used to calculate the clearance of a building or fire sector within a building of any use or unprotected area.

1.5 CROSS-BORDER CRITERIA

(1) Roof coverings of buildings less than 10 m from the relevant border must be at least class B_{ROOF} (t1) according to the SIST EN 13501-5 standard. This applies to the entire composition of the roof, and not only to the top layer. See also the requirements of point 2.4 regarding the transfer of fire across the roof due to a fire within the building and CNGV guideline 412.

(2) If the roof class Broof(t1) is based on EC Commission Decisions determining the reaction-to-fire class without testing, the roof composition (substrate) indicated in the EC Commission Decision should be taken into account. In the case of a tin roof, it is therefore necessary to take into account the overall composition of the roof.

Example 1: If a tin roof is mounted on a non-combustible substrate, this shall correspond to class B $_{roof}$ (t1) according to the EC Commission Decision, and if a tin roof is mounted on a combustible substrate (e.g. a wooden substructure), the composition of the roof shall be demonstrated or certified to correspond to B $_{roof}$ (t1). In the case of clay or concrete roof tiles, requirement B $_{roof}$ (t1) is met regardless of the base on which the roof is installed.

Example 2: When classifying the final roofing, it is necessary to take into account the basis on which it was tested and recorded in the classification report according to the standard SIST EN 13501-5. Installation in the roof is allowed only in accordance with the materials indicated in the report. Thus, a film that has been tested on a non-combustible substrate such as mineral wool is not suitable for installation on a combustible ESA, the composition of the roof does not provide class B $_{ROOF}$ (t1).

1.6 WITHDRAWAL OF ECONOMIC ISLANDS AND SPACEBARS WITH GUIDELINES FROM THE BUSINESS

(1) This point concerns ecological islands and trash cans. Garbage bins adjacent to one and two-dwelling buildings must be installed in such a way as to minimise the impact of the fire. This is achieved, for example, by having at least a 2.5 m zone of thermal insulation of the facade from non-combustible materials in all directions around the location of the bins.

(2) The distances of ecological islands and garbage bins from buildings that prevent fire transmission shall be determined depending on the number and size of garbage bins in the space, as set out in Table 3.

Table 3: Removal of garbage bins and eco-islands from buildings

Number and volume of bins	**Minimum deviation from the facade of the building in meters**
one 120-litre dumpster	2,5
one dumpster of 240 litres or three dumpsters of up to 120 litres capacity	4
organic island with up to four bins (each with a capacity of up to 760 l)	6
Open metal containers of a capacity not exceeding 6 m ^{3}, wooden bin huts	8

(3) Where the deviations referred to in the preceding paragraph cannot be achieved:

- Fence the room with a fire resistant wall EI 30. Fire-resistant walls and/or roofs must be located in all directions towards a building where the offsets are too small. The height of the firewall must be at least 100 cm higher than the height of the garbage bins or 2.5 m from the containers or the fire-resistant roof.
  or
- Carry out the fire-resistant wall of the building in at least EI 30 with a facade made of non-combustible materials (insulation and finishing layer) and without fire-resistant surfaces (e.g. windows) in all directions in the distance according to Table 3. In this case, there are no requirements for the implementation of fire-resistant walls of garbage cans.

(4) For cases not covered by this Guideline, CFPA-E Guideline No 7 shall apply.

1.7 WITHDRAWAL OF PROVISIONAL OBJECTIVES

(1) Requirements for the detachment of temporary buildings from buildings are set when they are located on parcels of the same owner or in the vicinity of neighbouring foreign real estate. Temporary buildings intended for the storage of material may, depending on the burning behaviour of the stored material, present an increased fire risk for the building.

(2) Temporary buildings must have a distance from nearby buildings as specified in Table 4. If a fire-resistant façade wall is required in Table 4, only a certain area of unprotected surfaces may be located in that wall. Areas which are not protected shall be determined in accordance with point 1.4.

Table 4: Requirements for the detachment of temporary buildings in relation to the fire resistance of the external wall of the building

Distance of the temporary building from the building in meters	**Fire load on a temporary facility**	
	< 250 MJ/m ^{2}	> 250 MJ/m2
More than 10 m	No requirements	No requirements
More than 5 m	No requirements	The exterior wall of the building must have a fire resistance (R)E 60.
Exceeding 2 m	No requirements	The exterior wall of the building must have a fire resistance (R)E 60.
Less than 2 m	The exterior wall of the building must have a fire resistance (R)E of 60 and must have a classification of at least A1 or A2-s1,d0.	The exterior wall of the building must have a fire resistance (R)EI 60 and must have a classification of at least A1 or A2-s1,d0. In this wall, fire-resistant surfaces are not allowed. Fire-retardant surfaces may be remote according to the requirements of points 2.4.3. and 2.4.4.

(3) For temporary buildings with a fire load higher than 250 MJ/m ^{2} and protected by a built-in full protection sprinkler system, the requirements for moving away from the building shall be halved.

(4) Departure of the building from the temporary building is determined according to the virtual boundary. The virtual boundary, which becomes the relevant boundary for the building, is determined by the temporary building according to the method 3 calculation.

1.8. RESET FROM TRANSFORMATORS TO THE PROFESSIONAL

The deviations between buildings and outdoor transformers shall be determined in accordance with Table 3 of SIST EN 61936-1.

1.9. ELECTRIC ENERGY FOUNDING HOLDINGS (HEE)

Departures between buildings and stand-alone buildings with outdoor HEE shall be determined in accordance with CNGV Guideline 417.

Example: Self-contained facilities with energy storage tanks are mostly container designs.

2. NON-SILITY OF CONSTRUCTION AND ENLARGEMENT OF BREAKDOWN BY STATIONS

Article 4

(length of construction and spread of fire in buildings)

(1) Buildings must be designed and built in such a way that their load-bearing structure retains the required load-bearing capacity for a certain period of time in the event of fire.

(2) Buildings must be divided into fire sectors if this is necessary to limit the rapid spread of fire within them. They must be designed and built in such a way as to limit as far as possible the rapid spread of the fire through vertical or horizontal connections. The division into fire sectors and their size depends on:
- the purpose of the building,
- the size and other architectural features of each building,
- the production process taking place in the building and the type and quantity of combustible materials present in the building,
- fixed or installed fire-extinguishing systems; and
- other fire safety measures implemented.

(3) In order to limit the rapid spread of fire within a building, building materials or construction products must be used which:
- It's hard to ignite,
- in the case of ignition, emit low amounts of heat and smoke; and
- limit the rapid spread of fire across the surface.

2.1 INTRODUCTION

(1) Point 2 of the technical guidelines sets out the methods of design and construction for:
- the fire performance of the load-bearing structure of buildings,
- fire performance of building elements that limit the rapid spread of fire across buildings,
- the division of buildings into fire and smoke sectors,
- smoke and heat extraction and control,
- sprinkler systems,
- safety systems with power supply and power conductor requirements.

(2) Unless otherwise specified in this Guideline, they shall be fire-separated:
- every floor,
- protected stairways and protected corridors,
- vertical connections such as elevators, shafts,
- parts of buildings with different purposes, especially if the fire loads are different.

In the case of the installation of an AGS in accordance with point 2.9, aggregation into larger sectors is permitted provided that:

- The building does not have an increased fire risk.
- have a lower fire load or fire risk level than the fire sector to which the fire sector is connected;
- in the case of smaller spaces, provided that the average fire load is not exceeded more than once.

(3) In some cases, both the fire resistance requirements (R) of the load-bearing structure (Table 7) and the fire resistance requirements (E and I) of the boundary construction elements of the fire sectors (Table 8) have to be taken into account in the design and construction.

Example 1: The wall can be an element of the load-bearing structure of the building with the fire resistance

requirement R 60, that is, it must maintain its load-bearing capacity in the fire for 60 minutes, and at the same time a border building element with fire resistance EI 30, which divides the building into fire sectors and must maintain the integrity E and insulation I 30 minutes.

Example 2: The fire resistance of the REI 60 fire sector means that the load-bearing structure retains a load-bearing capacity of 60 minutes and that the building elements separating the building into fire sectors ensure the integrity and insulation of the EI 60 (60 minutes).

(4) Proof of the fire resistance of the structure is the classification of the installed product in accordance with the SIST EN 13501-2 standard on the basis of testing the fire resistance of the element of the structure, or a design solution in accordance with the Rules on mechanical resistance and stability of structures (taking into account the standard fire in accordance with SIST EN 1363-1) in the construction plan, which demonstrates that the structure retains the required fire resistance in the event of fire in this technical guideline.
(5) Table 5 defines the classifications of classes of reaction-to-fire performance of structural elements used in this Guideline and the additional requirements related to reaction-to-fire performance.

Table 5: Classification of classes of reaction-to-fire performance of structural elements

Fire resistance:				
R	30	60	90	120
EW	30	60	90	120
EI	30	60	90	120
REI	30	60	90	120
Additional requirements related to fire resistance				
K_1 [1]	10	-	-	-
K2 [1]	10	30	60	-
M [2]	-	-	-	-

[1] Classes K_1 and K_2 indicate the ability of a wall, ceiling or roof covering to protect the lining material from ignition, charcoaling or other damage for a specified period of time.

[2] This additionally indicates the requirement when the wall must be resistant to mechanical influences (example: If part of the load-bearing wall is expected to collapse due to the fall of a heavy object during a fire, a mechanical resistance requirement may be added)

(6) Class K_1 tt and K_2 tt linings shall not be used to achieve the reaction-to-fire performance of the load-bearing structure or the reaction-to-fire performance of walls and ceilings.
(7) With regard to reaction to fire and the use of combustible/non-combustible building materials, unless otherwise specified in this technical guideline, CNG guideline 412 applies.
(8) Building materials of class F may not be used in construction unless they form an integral part of a construction product classified in a higher class.
(9) For metal-coated sandwich panels, see also the requirements of point 2.4.1.3.

2.2 NOSILITY OF CONSTRUCTION

(1) The load-bearing capacity (R) as a measure of the fire resistance of the structure supporting the building must be determined in such a way that the building retains, for a certain period of time, the stability specified in Tables 6 and 7 in the event of fire.
(2) In Tables 6 and 7, the number of floors does not take into account the attic if there are no spaces where users are permanently present (e.g. drying rooms, storage rooms, machinery spaces, technical spaces, spaces without workplaces). Nevertheless, the provisions of the fourth paragraph of this point must be observed.
(3) The determination of the required fire performance of load-bearing construction elements depends on:
- the number of floors,
- specific fire loads,
- the purpose or danger of fire,
- the size of the buildings,
- built-in automatic extinguishing system.

(4) For buildings whose parts have different purposes (e.g. commercial and garage part of the building), the highest requirements of each part of the building are taken into account for the load-bearing capacity of

the entire structure, regardless of the classification of the building according to the CC-SI.

Example: In the case of a building with a ground floor and two floors, part of which is a shopping centre and part of which is a multi-apartment building, and where no AGS is installed, the load-bearing capacity (R) is determined on the basis of a higher requirement, namely R 60.
In the case of a building with a ground floor and two floors, part of which is an office part of 600 m ^{2}, part of which is a warehouse with a fire load of more than 1000 MJ/m ^{2} of 500 m ^{2}, and no AGS is installed and the office and storage parts are not dilated, the load capacity (R) is determined on the basis of the higher requirement, namely R 60. Consider column P+2N.

(5) If it is part of a designated building that requires a higher fire resistance of the load-bearing structure and accounts for less than 10 % of the BTP of the building, it need not be taken into account when determining the load-bearing structure of the building.

Example: The ground floor building consists of a production part of 2,000 m ^{2} (fire load below 1,000 MJ/m ^{2}) and a storage part of 190 m ^{2} (fire load above 1,000 MJ/m ^{2}). Since the size of the warehouse is below 10 % of the BTP of the building, the fire resistance of the structure is determined for the whole building in relation to the productive part of the building, that is to say R 30.

(6) If the building is separated by a dilatation (the dilatation separates the load-bearing structure) and a fire-resistant wall is provided for on the dilatation, the fire resistance can be determined for each dilated part separately. Fire resistance of the wall on the dilation should meet a higher requirement.

Example: The building consists of a storage part (fire load above 1.000 MJ/m ^{2}, size 900 m ^{2}) and a production part (fire load below 1.000 MJ/m ^{2}, size 2.000 m ^{2}). Between the storage and production work there is a dilation. The fire resistance of structure R 60 is required for the storage part and the fire resistance of structure R 30 is required for the production part. The firewall on the dilation must be provided for in the implementation of REI 60.

(7) The load capacity (R) of basement floors, except for single-dwelling buildings (CC SI 1110), must be at least the same as required for the fire resistance of the above-ground part of the building, but not less than:
- R 60 if the building has only one basement floor,
- R 60, if the building has two basement floors,
- R 90 if the building has three or four basement floors,
- R 120 if the building has five or more basement floors.

(8) In buildings for which a wooden load-bearing structure is allowed, where people can be permanently present even in rooms more than 11 m above the level of the terrain, the staircase must have a fire-resistant structure made of non-combustible materials.

(9) For single- and double-dwelling buildings, the fire resistance of the load-bearing structure is determined according to Table 6. For the remaining buildings, the requirements set out in Table 7 shall be respected.

Table 6: Classes of fire resistance of the load-bearing structure for single-dwelling (CC-SI: 1110) and two-dwelling (CC-SI: 1121) Buildings

Number of above-ground floors Type of building or part of a building (CC-SI)	Ground floor	Ground and Floor	More than two floors
1110 - Single-dwelling buildings[1]	nz	nz	ng or R 30[2]
1121 - Two-dwelling buildings	ng or R 30[2]	R 30[2]	R 30[2]

ng — non-combustible load-bearing structure
nz - No requirements
[1] Functionally closed wholes – twins or terraced houses – buildings must be treated as separate fire sectors, separated from each other by the REI 60-M requirement (M – an example of an additional requirement applies if it can reasonably be expected that in the event of a fire mechanical collapse could occur due to the impact of the fall of the structure).
[2] A wooden load-bearing structure is allowed.

Table 7: Classes of reaction-to-fire performance of load-bearing structures for buildings. Unless explicitly stated otherwise, fire resistance applies to non-combustible materials

Number of above-ground floors Classification of the entire building or Part of a building (CC-SI)	[1]	ground floor up to 600 m² BTP[2]	(P+N) up to 600 m² BTP[2]	(P, P+N, P+2N) Exceeding 600 m2 BTP[2]	P+3N, P+4N	P+5N to the tall buildings
112 - Multi-apartment buildings	A	nr	R 60[3]	R 60[3]	R 60[4]	R 90
	B	nr	R 30[3]	R 30[3]	R 30[4]	R 60[4]
11301 residential buildings with serviced housing 1264 - Health care buildings where people can evacuate without foreign assistance	A	R 30[3]	R 60[4]	R 60[4]	R 60	R 90
	B	R 30[3]	R 30[3]	R 30[4]	R 60[4]	R 90
11302 - Residential buildings for other specific social groups	A	R 60[4]	R 60[4]	R 60[4]	R 60	nd
	B	R 30[3]	R 30[3]	R 60[3]	R 60[4]	R 90
121 - Catering buildings 122 - Commercial and administrative buildings 123 - Merchant and service buildings 1241 - Station buildings, terminals, communication buildings and associated buildings 1242 - Garage buildings 125 – Industrial buildings and warehouses above 250 MJ/m² to 1000 MJ/m² 1261 - Culture and entertainment buildings 1262 - Museums and libraries 1263 - Education and scientific research buildings 1265 - Sports buildings 1271 - Non-residential agricultural buildings 1272 - Ceremonial buildings (religious buildings, cemetery buildings)	A	ng or R 30[3]	R 30[3]	R 30[3]	R 60[4]	R 90
	B	nz	nz	R 30[3]	R 30[4]	R 60
125 – Industrial buildings and warehouses below 250 MJ/m2	A	nz	nz	ng or R 30[3]	R 60[4]	R 90
	B	nz	nz	ng or R 30[3]	R 30[3]	R 60
125 – Industrial buildings and warehouses above 1000 MJ/m2 and VRS	A	ng or R 30[3]	R 30[3]	R 60[4]	R 90	nd
	B	ng or R 30[3]	ng or R 30[3]	R 60[3]	R 60	R 90
1264 - Health care buildings where people cannot evacuate without foreign assistance	A	R 60	R 60	R 60	nd	nd
	B	R 60[4]	R 60[4]	R 60	R 60	R 90
1274 - Non-residential buildings n.e.c.	A	R 30	R 30	R 60	R 60	R 90
	B	Ng or R 30[3]	R 30[4]	R 30[4]	R 30	R 60

ng — non-combustible load-bearing structure
nz - No requirements
nr - Not applicable
nd – Not allowed
[1] A: Resistance of structure R – if there is no sprinkler system in the building in terms of complete protection.
B: Load-bearing capacity of structure R – if in the AGS building it complies with the requirements of point 2.9 in terms of

complete protection.
[2] BTP is determined in relation to the entire above-ground part of the building
[3] A wooden load-bearing structure is allowed.
[4] Wooden load-bearing structure protected by fire-resistant materials, in accordance with CNGV guideline 414, is allowed.
N.B.: Where a building is classified as a special fire-retardant building with regard to point 5, the requirements of the supporting guidelines shall be taken into account and the requirements concerning the fire resistance of the load-bearing structure shall in these cases be of an informative nature. In the absence of requirements in the supporting guidelines, Table 7 shall be followed.

2.3 SECTORS OF FIRE

2.3.1 Basic requirements

(1) Adequate integrity (E) and insulation (I) as criteria for fire resistance of border elements of the fire sector shall be considered to be achieved if the requirements of Table 8 are respected.
(2) If the fire resistance of the supporting structure is not required for a building, but separation into fire sectors is required, these separations must be designed in such a way that the boundaries of the fire sector in a fire are not broken down.

Table 8: Classes of reaction-to-fire performance of boundary elements of fire sectors for buildings.

Number of above-ground floors Classification of the entire building or Part of a building (CC-SI)	[1]	(P, P+1N) up to 600 m^2 BTP[2]	(P, P+1N, P+2N) Exceeding 600 m2 BTP[2]	P+3N, P+4N	P+5N to the tall buildings
112 - Multi-apartment buildings	A	EI 60[3]	EI 60[3]	EI 60[3]	EI 90
	B	EI 30[3]	EI 30[3]	EI 30[3]	EI 90[4]
11301 - Residential buildings with serviced housing 1264 – Healthcare buildings; where people can evacuate without foreign help	A	EI 60[4]	EI 60[4]	EI 60	EI 90
	B	EI 30[3]	EI 30[4]	EI 60[4]	EI 90
11302 - Residential buildings for other specific social groups	A	EI 60[4]	EI 60[4]	EI 60	nd
	B	EI 30[3]	EI 30[3]	EI 30[4]	EI 90
121 - Catering buildings 122 - Commercial and administrative buildings 123 - Merchant and service buildings 1241 - Station buildings, terminals, communication buildings and associated buildings 1242 - Garage buildings 125 - Industrial buildings and warehouses up to 1000 MJ/m2 1261 - Culture and entertainment buildings 1262 - Museums and libraries 1263 - Education and scientific research buildings 1265 - Sports buildings 1271 - Non-residential agricultural buildings 1272 - Ceremonial buildings (religious buildings, cemetery buildings)	A	EI 30[3]	EI 30[3]	EI 60[4]	EI 90
	B	EI 30[3	EI 30[3]	EI 30[4]	EI 60
125 – Industrial buildings and warehouses above 1000 MJ/m2 and VRS	A	EI 30[4]	EI 60	EI 90	nd

	B	EI 30[4]	EI 60[4]	EI 60	EI 90
1264 – Health care buildings where people cannot evacuate without foreign assistance	A	EI 60	EI 60	nd	nd
	B	EI 60[4]	EI 60	EI 60	EI 90
1274 - Non-residential buildings n.e.c.	A	EI 30	EI 60	EI 60	EI 90
	B	EI 30[4]	EI 30[4]	EI 30	EI 60

ng — non-combustible load-bearing structure
nz - No requirements
nr - Not applicable
nd – Not allowed
[1] A: Fire performance of border elements – if there is no sprinkler system in the building in terms of full protection.
B: Fire performance of border elements – if the AGS building complies with the requirements of point 2.9 in terms of full protection.
[2] BTP is determined in relation to the entire above-ground part of the building
[3] In addition to non-combustible materials, wooden border elements are also allowed
[4] In addition to non-combustible materials, wooden border elements are also allowed, provided that they are implemented in accordance with CNGG 414.

N.B.: Where a building is classified as a special fire-fighting building according to point 5, the requirements of the supporting guidelines shall be taken into account and the fire resistance requirements of the border elements shall be informative in these cases. In the absence of requirements in the supporting guidelines, Table 8 shall be taken into account.

(3) For buildings whose parts have different purposes (e.g. shopping centre and garage), the fire resistance of the wall at the boundary of different purposes is determined on the basis of the purpose, which has higher requirements.

(4) In fire-resistant lightweight mounting walls, the installation of electrical cabinets, sockets or cabinets of machine devices, e.g. underfloor heating, is not allowed. Notwithstanding the preceding sentence, cabinets and other devices may be installed in accordance with the manufacturer's instructions, provided that they are intended to be installed in fire-resistant lightweight prefabricated walls and that they do not reduce the fire-resistance of the wall by their installation.

Example: The installation of electric doses in a fire-resistant lightweight wall is allowed, provided that the dose has proven fire resistance, the installation must comply with the instructions.

2.3.2 Size of fire sectors

(1) The maximum permitted BTP (m^2) of fire sectors depends on the intended use of the building or the spaces within it and may be higher if active fire protection systems are installed in the building. The limit values for the areas of fire sectors are set out in Table 9 both for the case of no active fire protection and for the cases of AJP installed and AGS installed. The requirements for ODT are set out in point 2.8.

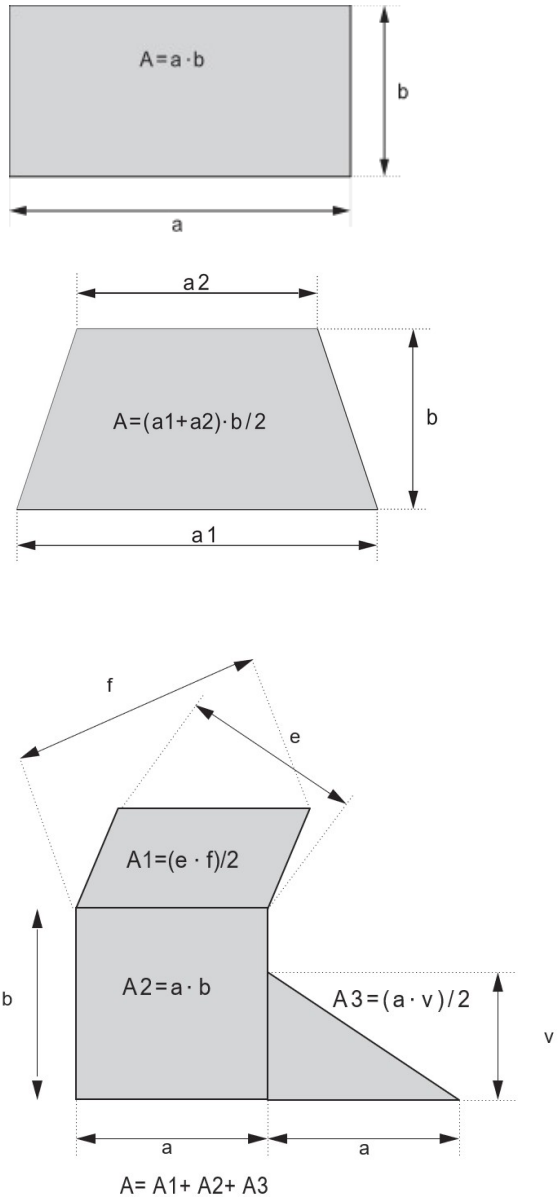
(2) The size of the fire sector can be determined in several ways:
- the simple way is to multiply the extreme width and the extreme length of the fire sector for regular rectangular shapes to give the gross floor area of the fire sector;
- in the case of irregular shapes, medium lengths and/or widths may be used, multiplied to give the gross floor area of the fire sector;
- The size of the fire sector may also be determined by summing the gross floor area of all spaces within the fire sector.

In the event that the fire sector extends over several floors, the size of the fire sector shall be determined by summing the BTP of all floors. The area of each floor shall be determined in accordance with the preceding paragraph.

(3) When there is a gallery in the fire sector, its BTP is added to the BTP floor in the room where it is located. If the BTP of additional walking floors inside the room exceeds 50 % of the BTP of the room, such a surface is understood as an additional floor. The fire resistance of the gallery load-bearing structure must be the same as that of the building, except for galleries smaller than 100 m^2.

(4) The size of the fire sector of regular shapes such as a square or rectangle shall be determined as the product of width (b) and length (a): A = a x b. For other forms of fire sectors that have a geometric shape, the size of the fire sector can be determined in the same way as the area of the geometric figure is determined. However, where the fire sector is of irregular shape or consists of several regular shapes, the size of the fire sector shall be determined as the sum of the individual sizes of the spaces as shown in

drawing 6.



Drawing 6: Demonstration of the determination of the calculation of the size of the fire sector.

Table 9: Maximum BTP (m^2) of fire sectors depending on the purpose and installed APZ systems.

Destination of a building or part of a building (CC-SI)	No AJP and no AGS	AJP	AGS [1]	The fire sector can extend over several floors
121 - Catering buildings 1261 - Culture and entertainment buildings 1262 - Museums and libraries	1.000	3.600	8,000[2]	yes
122 - Commercial and administrative buildings 1271 - Non-residential agricultural buildings	1.000	3.600	8.000	yes
123 - Merchant and service buildings 1241 - Station buildings, terminals, communication buildings and associated buildings 1263 - Education and scientific research buildings 1265 - Sports buildings 1272 - Ceremonial buildings (religious buildings, cemetery buildings)	1.000	3.600	10,000[2]	yes
1242 - Underground Garage Buildings[3] 1242 - Closed Garage Buildings	500	4.000	8.000	yes

1242 - Open Garage Buildings	1.000	8.000	well	yes
125 – Industrial buildings and warehouses (< 300 MJ/m ^{2}), excluding VRS	2.000	10.000	well	yes
125 – Industrial buildings and warehouses (≥ 300 MJ/m ^{2} and < 1000 MJ/m ^{2}), excluding VRS	1.000	5.000	20.000	yes
125 – Industrial buildings and warehouses (≥1 000 MJ/m ^{2}), excluding VRS	400	2.000	8.000	not
11301 - Residential buildings with serviced housing 1264 - Health care buildings where people can be evacuated without foreign assistance 1274 - Non-residential buildings n.e.c.	1.000	3.600	5.000	not
11302 - Residential buildings for other specific social groups 1264 – Health care buildings where people cannot evacuate without foreign assistance	nd	1.000	8.000	not
125 – VRS	nd	1.000	8.000	not

[1] The automatic fire-extinguishing system is installed in the building in the sense of full protection in accordance with the requirements of point 2.9., the surface limit values shall not be applied if the automatic fire-extinguishing system is installed only in the garage
[2] AJP is also required.
[3] See the requirements of paragraphs 7 and 8 of this point.
No - no limit
nd – Not allowed

Note 1: Where a building is classified as a special fire-fighting building according to point 5, the requirements of the supporting guidelines shall be taken into account and the size of the fire sectors shall be informative in these cases.

Note 2: The average fire load within one fire sector shall be taken into account when calculating the fire load.

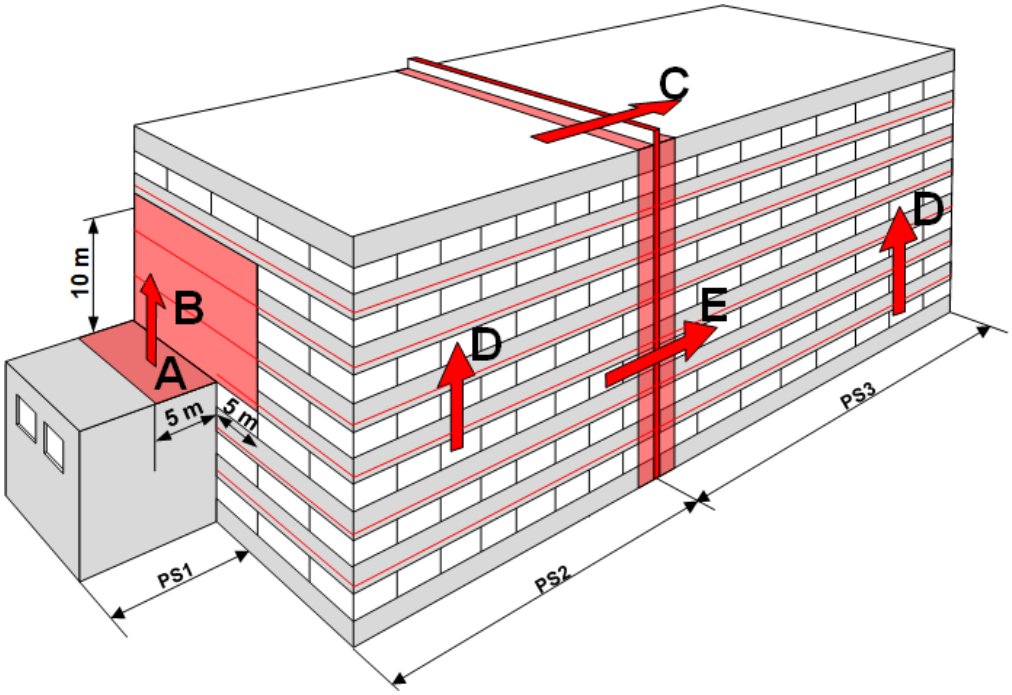
Example of fire load calculation: A small industrial building with a business annex has a wooden supporting structure, the facade is made of sandwich panels PIR, glass fiber insulation is used in the walls. To the stationary fire load we have to add a wooden structure, facade panels, combustible insulation of mechanical and electrical devices, etc. …. To the movable fire load must be added the maximum quantities of combustible material that can be in the rooms. These can include e.g. tables, products and packaging material, combustible material on machines, etc.… Fire load is the sum of stationary and mobile fire load.

(5) If a building has several fire sectors and only a few fire sectors require an AJP or ASG system in Table 9, this system shall be installed throughout the building. This requirement may only apply to part of the building if the other parts of the building are fire-separated by walls (R)EI 90 and protection of passageways EI 90 and have completely separate escape routes. The requirement of complete protection of the building does not apply to apartments.
(6) The fire sector may extend over a maximum of three floors. If the building is a building with atriums, point 2.11.7 must be taken into account.
(7) In buildings where there is a building with a different purpose above the underground garage and in cases where the garage is located on the second or lower floor, an automatic extinguishing system – a system according to point 2.9 of this technical guideline – must be installed throughout the garage. If an automatic fire-extinguishing system is only required in the garage part of the building (due to the size of the fire sectors, it is not required in the remaining parts of the building), it does not need to be installed in the remaining parts of the building. If there are no spaces with other purposes above the garage, the installation of an automatic stable fire extinguisher is not required due to the requirements of protecting the garage on the second or lower floor (the requirement to install AGS remains unchanged due to the size of the fire sector).
(8) Regardless of the location and size of the garage, AGS must be installed in automated mechanical garages designed for more than 50 cars in accordance with point 2.9 of Technical Guideline TSG-1-001. The requirements of paragraph 7 remain unchanged.

2.4 BREAKING OUT OF THE EXTERNAL STATE AND STRENGTH OF THE STATE

(1) The outer walls and roof of a building must be designed and built in such a way that thermal radiation for a certain period of time cannot cause vertical transmission of fire on the outer walls and lower-lying roofs, nor horizontal transmission of fire on the outer walls and roof.

(2) Drawing 7 shows examples of measures to prevent fire transmission on external walls and roofs between fire-separated parts of buildings (between fire sectors). Requirements concerning the fire performance of materials and dimensions of firewalls are given in this point.



A) Preventing the spread of fire from the lower to the higher part of the facility:
If the outer wall above the roof of the lower part of the building is fire-resistant, this part of the roof shall have sufficient fire resistance RE (duration of fire resistance according to Tables 7 and 8) or an automatic fire-extinguishing system shall be installed in the extension.
B) Preventing the spread of fire from a lower to a higher object:
This part of the wall must not have fireproof surfaces if the roof of the lower part of the building does not meet the requirements of A)
C) Preventing the spread of fire over the roof – see points 2.4.2. and 2.4.4.2.
D) Prevention of vertical spread of fire through external walls – see points 2.4.1.1 to 2.4.1.5 and 2.4.3
E) Preventing the horizontal spread of fire through the outer walls depends on the angle α formed by the outer wall at the contact with the firewall:
α = > 135° - the horizontal spacing between windows and the width of the non-combustible barrier depends on type of façade: - wooden: see point 2.4.1.2
- sandwich plates: see point 2.4.1.3
- Composite system: see point 2.4.1.4
- ventilated: see point 2.4.1.5
- suspended: see point 2.4.1.6
- double façade: see point 2.4.1.7

α < 135°– see 2.4.4.1

Drawing 7: Expansion of fire through external walls and roof

2.4.1 Requirements for the installation of external wall materials

2.4.1.1 Materials and products for facades

(1) The minimum requirements for the class of combustibility of external wall coverings are given in Table 10. If a different requirement is required due to deviations of the building from the relevant boundary, a stricter requirement must be respected.

Table 10: Fire response requirements for external wall claddings

	Building height, facade classification [1]	
Buildings from CC-SI Groups:	up to 10 m	from 10 m to tall buildings
111 - Single-dwelling buildings	D-s3,d2	B-s3,d0
112 - Multi-apartment buildings	D-s2,d0	B-s3,d0
11301 - Residential buildings with serviced housing	for ground floor buildings D-s2,d0, for buildings with several above-ground floors A1 or A2-s1,d0	A1 or A2-s1,d0
11302 - Residential buildings for other specific social groups	for ground floor buildings D-s2,d0, for buildings with several above-ground floors A1 or A2-s1,d0	A1 or A2-s1,d0
12111 - Hotel and similar buildings for short-term accommodation 12112 - pubs, restaurants and bars 1212 - Other catering buildings for short-term accommodation	D-s2,d0	B-s3,d0
122 - Commercial and administrative buildings	D-s2,d0	B-s3,d0
123 - Merchant and service buildings	D-s2,d0	B-s3,d0
1241 - Station buildings, terminals, communication buildings and associated buildings 1242 - Garage buildings	D-s2,d0	C-s3,d0
125 - Industrial buildings and warehouses free from hazardous chemicals and with a fire load below 1000 MJ/m2	D-s2,d0	C-s3,d0
125 - Industrial buildings with hazardous chemicals (chemical industry) 125 - Industrial buildings with a fire load equal to or greater than 1,000 MJ/m2	A1 or A2-s1,d0	A1 or A2-s1,d0
1261 - Culture and entertainment buildings 1262 - Museums and libraries	for ground floor buildings D-s2,d0, for buildings with several above-ground floors B-s3,d0	B-s3,d0
1263 - Education and scientific research buildings	for ground floor buildings D-s2,d0, for buildings with several above-ground floors B-s3,d0	A1 or A2-s1,d0
1264 - Health care buildings; where people can evacuate without foreign help	for ground floor buildings D-s2,d0, for buildings with several above-ground floors B-s3,d0	A1 or A2-s1,d0
1264 – Health care buildings where people cannot evacuate without foreign assistance	A1 or A2-s1,d0	A1 or A2-s1,d0
1265 - Sports buildings	D-s2,d0	B-s3,d0
1271 - Non-residential agricultural buildings	D-s2,d0	C-s3,d0
1272 - ceremonial buildings 1273 - Cultural heritage not otherwise used	D-s2,d0	B-s3,d0
1274 - Other buildings n.e.c.	D-s2,d0	B-s3,d0
12740 - Re-education centres, prisons	A1 or A2-s1,d0	A1 or A2-s1,d0
Buildings with spaces for many users [2]	for ground-floor and single-storey buildings D-s2,d0, for buildings up to 10 m in height with several above-ground floors B-s3,d0	A1 or A2-s1,d0

For high-rise buildings, see CNGG 310.
[1] For ETICS, see additional condition in point 2.4 of this Guideline.
[2] If, regardless of the basic classification, a building falls within the category of buildings with spaces for a large number of users, a more stringent requirement must be observed.

(2) Notwithstanding the preceding paragraph, even for buildings up to 10 m high which are separated in height into several fire sectors, the linings of external walls in a 1 m band around fire-resistant surfaces (e.g. around windows, balcony doors, entrances, etc.) must be of at least class B-s3,d0. Linings with worse fire performance than those specified in Table 10 may be used only at a distance of not less than 1 m from areas not subject to fire protection. For internal angles, see additional requirements of point 2.4.4.1. Buildings up to 10 m in height which are not fire-separated in several fire sectors may have linings made of D-s2,d0 class material.

(3) Notwithstanding the preceding paragraphs, the thermal insulation of the floor wall up to a height of 0.8 m can be made of combustible material.

(4) Notwithstanding the other requirements of this Guideline, the lining of the outer wall must be between 0,8 m and a minimum height of 2,5 m above the terrain of Class A1 or A2-s1,d0 if parking areas for motor vehicles and bicycles are provided adjacent to the building up to a distance of 3 m from the façade. The

requirement does not apply to buildings belonging to groups CC-SI 111 – Single-dwelling buildings, 122 – Commercial and administrative buildings, 125 – Industrial buildings, 1271 – Non-residential agricultural buildings, 1272 – Cretaceous buildings, 1273 – Cultural heritage not otherwise used, and to buildings of other groups that are not separated in height in several fire sectors.

2.4.1.2. Wooden facades

(1) If the classification of facade D-s2,d0 for ground floor or for several floors is allowed in Table 10 and the entire above-ground part of the building is one fire sector, a wooden facade without requirements to limit the spread of fire on the facade is allowed.

(2) Where a non-combustible façade in class A1 or A2-s1,d0 is not required in Table 10, wood façade cladding shall also be permitted for buildings where there are fire resistance requirements for boundary elements between floors and spaces, provided that the following conditions are met:

- appropriate technical fire protection measures must be implemented to limit the spread of fire on the façade,
- only performances in accordance with SZPV IZS 414 are allowed, performances depend on the designated use of the premises, deviations from the requirements of SZPV IZS 414 are not allowed,
- the number of above-ground floors referred to in Table 11 is not exceeded,
- the installation requirements for active fire protection systems in Table 11 shall be complied with;

Table 11: Wooden facades

Buildings from CC-SI Groups	Maximum number of overhead floors (buildings without full protection with AJP according to point 3.5 and without AGS according to point 2.9)	Maximum number of overhead floors (buildings with full protection with AJP system according to point 3.5 and without AGS according to point 2.9)	Maximum number of overhead floors (buildings with full protection with AJP system according to point 3.5 and with full protection with AGS according to point 2.9)
111 Single-family buildings	Not applicable	Not applicable	Not applicable
1121 Two-family buildings	2	3[2]	Not applicable
1122 Three- and multi-dwelling buildings	2	3[2]	Up to high
12111 - Hotel and similar buildings for short-term accommodation 1212 - Other catering buildings for short-term accommodation	1	3[1]	5[1]
12112 - pubs, restaurants and bars	2	3	5[1]
122 - Administrative and office buildings 123 - Commercial and other buildings for service activities 124 - Transport and electronic communications buildings 125 - Industrial buildings and warehouses below 1000 MJ/m2 1261 - Culture and entertainment buildings 1262 - Museums and libraries 1263 - Education and scientific research buildings 1265 - Sports halls 127 - Other non-residential buildings	2	3	Up to high
Buildings with spaces for many users	1	3	5
Buildings of other uses	Not allowed	Not allowed	Not allowed

[1] If there are sleeping persons in the building, an alarm must be carried out in each bedroom (alarm volume >75 dB).

[2] Detectors are also required inside apartments and may also meet the requirements of the standard referred to in point 3.5, twelfth

paragraph.

Example of implementation: A primary school with two above-ground floors, which are fire-separated, can have a ventilated façade with a wooden outer lining. The insulation of the facade must be non-combustible (at least class A2-s1,d0). At the height of the interstorey panel between the first and second floors, the wooden cladding of the facade is interrupted by a metal profile with a thickness of at least 1.5 mm, which is attached to the supporting structure, for details see guideline CNG IZS 414.

Example of implementation in the case of 1122 Three- and multi-dwelling buildings: In the case of two above-ground floors, a fire alarm system must be installed in accordance with the 12th paragraph of point 3.5. In the case of three above-ground floors, the installation of the AJP system is required in common areas in accordance with point 3.5, paragraph 2, and inside apartments in accordance with point 3.5, paragraph 12.

(4) In the case of buildings with a wooden substructure of the facade, regardless of the finishing layer or lining, the requirements applicable to facades with a wooden lining must be observed. For such buildings with a height above 10 m or with more than three floors above the ground, additional measures are required, such as:

- the construction of a façade without empty spaces through which the fire could spread,
- an outer finishing layer made of non-combustible material with a thickness of not less than 0,5 mm, and
- an inner wall with a fire resistance of at least EI 30 or as required for the load-bearing structure according to point 2.2.

(5) If wood is used in the facade as an external lining or as a substructure, then a non-combustible material (A1 or A2-s1,d0) must be used for thermal insulation. Notwithstanding the preceding sentence, insulation material of at least D-s3,d0 classification shall be permitted in buildings that are one fire sector.

2.4.1.3 Sandwich panels with double-sided metal cladding

(1) The centre of the metal-coated sandwich panels shall not be of thermoplastic material and shall be at least of Class E material.

(2) The minimum requirements for reaction to fire of sandwich panels are given in Table 12 according to the intended use.

(3) If a building with walls and/or roofs made of sandwich panels with combustible insulation is divided into several fire sectors, the fire-resistant walls or inter-storey panels with such a wall and/or roof shall be fitted at the point of contact with a non-combustible material separation belt or a sandwich panel with non-combustible insulation, with a width of at least 1 m. The same shall apply to the horizontal contact of two fire sectors on the façade of the building. For internal angles, see additional requirements of point 2.4.4.1.

(4) Notwithstanding the preceding paragraph, sandwich panels may be used to carry out fire-resistant walls at the border of fire sectors, provided that they have the appropriate fire-resistance classification in accordance with SIST EN 13501-2 and that they are installed in accordance with the fire-resistance testing documentation (e.g. test-proven fire-resistance of the joints of panels at horizontal and vertical fire limits).

(5) If sandwich panels are used as fire separation walls between sectors or on the façade due to deviations from adjacent structures, the overall structure of the sandwich panels shall ensure at least the same level of fire resistance as required for the fire resistant boundary or façade element.

Example: Due to the proximity of the relevant border, the fire resistance of the facade wall E 60 is required. All load-bearing structures of such a wall must ensure fire resistance R 60. The demolition of a part of a building or roof, for which e.g. the fire resistance of the R 30 structure is required, must not affect the demolition of the E 60 fire-resistant façade.

(6) When using combustible sandwich panels, the additional fire load due to the combustible material inside the sandwich panel must be taken into account.

(7) When using sandwich panels for the implementation of fire-resistant walls or ceilings, it is necessary to choose a building element and take into account the relevant documentation with technical details for the implementation, which ensures the prescribed fire resistance (e.g. contact of sandwich panels with a concrete inter-storey structure at the border of two sectors, method of fastening the panels to the supporting structure, etc.).

(8) For the planning of the division of fire sectors and the implementation details for the construction of buildings with sandwich panels, SZPV Guideline 415 shall be taken into account.

Table 12: Requirements for sandwich panels with double-sided metal lining

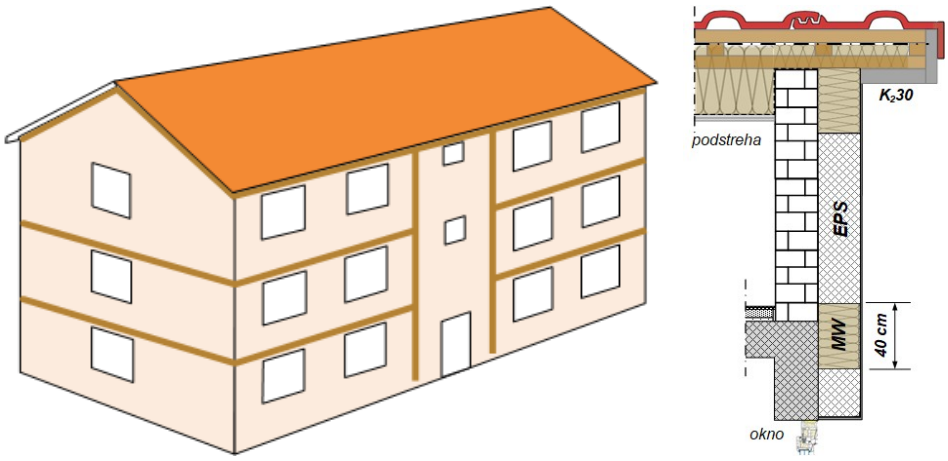
Buildings from CC-SI Groups:	Response to fire
11 - Residential buildings 121 - Catering buildings 122 - Administrative and office buildings 126 - Buildings of general social interest 1272 - Religious service buildings, cemetery buildings 1273 - Cultural monuments 1274 - Other non-residential buildings	A2-s1,d0
123 - Commercial and other buildings for service activities 124 - Transport and electronic communications buildings 125 – Industrial buildings and warehouses 1271 - Non-residential agricultural buildings	C-s3,d0 for buildings ≤ 10 m in height B-s1,d0 for buildings from 10 m height up to high

2.4.1.4 Composite system for external thermal insulation of buildings (ETICS) with combustible insulation

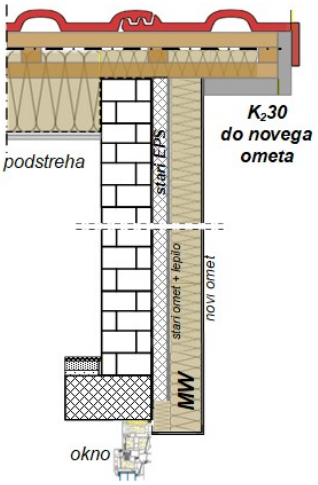
(1) A building external thermal insulation composite system (ETICS) of at least class B-s3,d0 shall be used for:

- buildings with a height of up to 10 m are not restricted except for the purposes referred to in the third paragraph,
- buildings with a height of 10 to 22 m and fire separation between floors is required, the spread of fire in the area above the windows or doors (at the level of the inter-storey panel) is limited by replacing the zone of combustible insulation with a non-combustible insulation with a melting point above 1000º degrees at least 40 cm high throughout the perimeter of the building. Belts shall be carried out at each border of the fire sector and under the roof (see drawing 8). Horizontal fire transmission shall be limited by belts with a width of at least 20 cm or by wall thickness, whichever is greater. The non-combustible insulation must be fixed with anchors. Carrying out belts with non-combustible insulation is not necessary if the insulation layer is thinner than 5 cm.

Example: The facade is classified as a whole, that is, all the facade layers together with the insulation (façade system). The Certificate of Characteristics (DoP) of the façade system states the class of reaction to fire of the façade system and thermal insulation.



Example: Energy remediation:



Drawing 8: Example of the implementation of belts at the boundaries of fire sectors and at the roof level

(2) If a fire separation of the attic from the lower floors is foreseen, the transfer of fire from the lower floor through the facade to the attic is prevented by carrying out a fire-resistant lining in $K_2$30 (if an arch is foreseen) and by carrying out a horizontal belt 20 cm high at the facade-roof junction.

(3) For buildings with a purpose of 1263 - buildings for education and scientific research work, 1264 - buildings for medical care, where people can be evacuated without foreign assistance, and buildings with premises for many users, regardless of the height of the building in case of fire separation at the level of the inter-storey panel, the transmission of fire across the façade in accordance with paragraph (1) shall be limited.

2.4.1.5 Ventilated façades

(1) Materials for the manufacture of ventilated façades shall be non-combustible, fire-response class A1 or A2-s1,d0, except for façade protective film if it is not more than 1 mm thick and has at least E fire-response class. Notwithstanding the preceding sentence, in buildings that are one fire sector and do not have a basement, insulation material of at least class D-s3,d0 may be permitted.

(2) If the substructure of the ventilated façades is wooden, these façades are placed among the wooden façades (see point 2.4.1.2).

(3) Ventilated façades with a wooden substructure must be carried out at the boundaries of the fire sectors in such a way as to prevent the transmission of fire through the ventilation room. The ventilation compartment shall be interrupted e.g. by non-combustible insulation or a building element made of non-combustible material (e.g. metal profile) or by open fire barriers with proven fire resistance according to SIST EN 1364-6.

(4) A ventilation space between the insulation or the façade protective film and the final lining may be allowed up to a maximum of 6 cm.

2.4.1.6 Suspended facades

(1) The suspended façade must comply with the harmonised standard SIST EN 13830. If the fire resistance of the parapet or the entire façade is required, this shall be demonstrated by a classification report according to SIST EN 13501-2 based on the results of tests according to SIST EN 1364-3 and/or SIST EN 1364-4.

(2) The suspended façade must be fixed with steel fasteners on each inter-storey building board, and the gap between the façade and the inter-storey structure must be sealed in such a way that the transfer of fire to the upper floor is not possible in the same way as specified in the classification report on the basis of the results of testing according to SIST EN 1364-3 and/or SIST EN 1364-4

(3) Horizontal fire transmission at the contact of the firewall with the suspended façade shall be prevented in the same way as specified in the classification report on the basis of the results as when tested according to the SIST EN 1364-3 standard or with a fire gasket for linear contacts and gaps according to the European

Technical Assessment ETA prepared according to the European Assessment Document EAD 350141-00-1106. Sealing is carried out in the width of the stand of the suspended facade.

(4) If the firewall contact at the inner corner of the façade is less than 135°, the entire suspended façade configuration shall have sufficient fire resistance proven by testing according to SIST EN 1364-3. The minimum width of the fire-resistant part of the façade is set out in Chapter 2.4.4.

2.4.1.7 Double facades

For double facades, SZPV guideline 208 Double façade buildings shall be used.

2.4.2 Roof structures

(1) The roof structure or products from which the roof is made must not accelerate the spread of fire in the building or endanger neighbouring buildings in the event of a fire in the building. In the field of fire separations between fire sectors extending to the roof, provision must be made for implementations in accordance with point 2.4.4.2 and in accordance with the examples in CNGV guideline 211.
(2) Roof coverings that are not resistant to flying butts and radiant heat (F_{ROOF} (t1) according to SIST EN 13501-5) are only allowed on buildings where the firewall does not touch the roof (see 2.4.4.2 (2)) and the building is at least 10 m from the relevant boundary.
(3) The reaction-to-fire class of parose films, vapour-permeable films, secondary roofing films, etc. shall be at least E.
(4) Tables 13 to 16 provide examples with minimum requirements.
(5) Roofs exceeding the permitted sizes of roof surfaces listed in Tables 13 to 15 should be separated into smaller areas. The combustible thermal insulation shall be interrupted by 2 m wide non-combustible insulation bands. In case of fire separation of spaces under the roof, the requirements of point 2.4.4.2 shall be respected.
(6) Thermoplastic insulation materials can only be placed on the ceiling with a fire resistance of at least REI 30, preventing the spread of fire by means of molten insulation, burning droplets that can drip in the room to the floor, to equipment, to persons evacuating, or to firefighters. The use of insulating materials which liquefy directly to sheet metal or to non-fire resistant ceiling panels is not permitted.
(7) If an evacuation route passes through the roof, the roof shall be fire-resistant as required for the fire resistance of the load-bearing structure, but not less than REI 30. Notwithstanding the requirements in other points of this guideline, the insulation of the roof from materials with fire-response class A1 or A2-s1,d0. In the case of combustible waterproofing film, non-combustible concrete slabs with a thickness of at least 4 cm or cement screed with a thickness of at least 3 cm must be installed over the film in the part where the evacuation takes place, and in the part where the evacuation does not take place, the non-combustible top layer referred to in point 2.4.2.1., second paragraph.
(8) The reaction to fire of the ceiling, which is also the roof of the room, must be at least of the class specified in Chapter 2.5.2. As a rule, roof insulation is classified on the basis of the results of the end-use insulation testing according to the SIST EN 15715 standard.
(9) Where a building is a special building, the requirements of the supporting guidelines referred to in point 5 must be taken into account.
(10) If the roof panel is not fire resistant to at least REI30, the combustible thermal insulation laid on the roof structure should be added to the fire load of the room.

2.4.2.1 Flat roofs with non-combustible top layer

(1) Table 13 sets out the reaction-to-fire requirements for products of which non-combustible top-tier roofs are made.
(2) A layer of gravel with a thickness of at least 50 mm or a weight of ≥ 80 kg/m^2 (grain size 4 mm to 32 mm), a cement screed with a thickness of at least 30 mm or a concrete slab or a slab of natural stone with a thickness of at least 40 mm shall be considered as a non-combustible top layer.

Explanation: A layer implemented in accordance with the second paragraph 2.4.2.1 is considered to be resistant to flying butts and radiant heat-B_{ROOF} (t1).

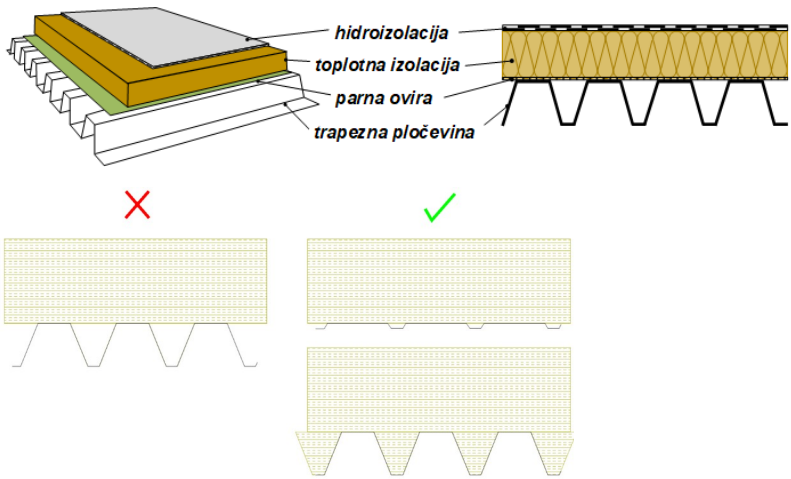
(3) If there are several fire sectors under the same roof, the requirements of point 2.4.4.2 shall also be taken into account. At the point of contact of the firewall with the roof, the combustible thermal insulation must be replaced by a belt of at least 2 m width made of non-combustible insulation: in the case of trapezoidal sheet metal, the cavities in the trapezoidal sheet should be closed with rock wool.

Table 13: Required minimum reaction-to-fire classes for flat roof products with non-combustible top coat

Consequence No of composition	Roof composition from top to bottom	Minimum fire response class thermal insulation	Particularities	Fire resistance of the roof from the underside	Area limit (m^2)
1	-Layer according to paragraph 2.4.2.1. -Hydroisolation -Thermal insulation -Parliamentary prison -concrete construction minimum REI30	E	Laid without air layer	REI 30 (ng)	according to the size of the fire sector
2	-Layer according to paragraph 2.4.2.1. -Hydroisolation -Thermal insulation -Parliamentary prison -Trapenic sheet	A1 or A2-s1,d0 or no insulation		nz	according to the size of the fire sector
3[4]	-Layer according to paragraph 2.4.2.1. -Hydroisolation -Upper thermal insulation -lower thermal insulation with a thickness of at least 10 cm -Parliamentary prison -Trapenic sheet	Upper insulation E [1] Lower insulation A1 or A2-s1,d0	Laid without air layer	nz	a maximum of 1,200[3] and according to the size of the fire sector
4[4]	-Layer according to paragraph 2.4.2.1. -Hydroisolation -Thermal insulation -Parliamentary prison -Trapenic sheet -Fire resistant coating $K_2$30 or EI30	D [1] or B-s2,d0[2]	Around the lights, drains or other penetrations through the roof should be installed min. 50 cm of non-combustible insulation Laid without air layer	$K_2$30 (ng) or EI30 (ng)	a maximum of 1,200[3] and according to the size of the fire sector
5[4]	-Layer according to paragraph 2.4.2.1. -Hydroisolation -Thermal insulation (with or without) -Parliamentary prison -sandwich panels of at least REI30 class	Thermal insulation: E [1] or C-s2,d0[2] Roof panel: B-s2,d0	Laid without air layer	REI30	Top layer maximum 1,200[3] and according to the size of the fire sector
6	-Layer according to paragraph 2.4.2.1. -Hydroisolation -Thermal insulation -Parliamentary prison -Wooden load-bearing structure with sheets up to 25 mm thick on the load-bearing structure	A1 or A2-s1,d0 or no insulation		Nz	according to the size of the fire sector
7	-Layer according to paragraph 2.4.2.1. -Hydroisolation -Thermal insulation -Parliamentary prison -Cross-glued wooden load-bearing structure REI30	E [1] or C-s2,d0[2]	Around the lights, drains or other penetrations through the roof should be installed min. 50 cm of non-combustible insulation	REI 30	a maximum of 1,200[3] and according to the size of the fire sector

Comments:
[1] It is not made of foamed or other dripping materials such as EPS, XPS.
[2] Classification of the reaction to fire of the heat-insulating product according to the end use based on the results of testing according to EN 15715
[3] Larger surfaces are possible if, in a band of at least 2 m, the combustible insulation is replaced by a non-combustible one.
[4] Composition not permitted above designated spaces 113, 121, 1264 and 1274
nz - No requirements
ng — non-combustible material

Example of the design of the air layer: As a performance without an air layer, the laying of thermal insulation with a load of at least 60% is understood. In the case of minor loading, it is possible to fill the hollow spaces in the trapezoidal sheet with non-combustible insulation.



Drawing 9: A typical version of a roof on a trapezoidal sheet with an air layer and an example of filling hollow spaces in a trapezoidal sheet

2.4.2.2. Flat roofs with combustible top layer

(1) Table 14 gives the minimum requirements for the reaction-to-fire class of products from which flat roofs with a combustible top layer are made.
(2) If the roof requires resistance to flying butts and radiation heat Broof(t1), this must be proven for the top layer together with thermal insulation.

Table 14: Required minimum reaction-to-fire classes for flat roof products with combustible top coat

Consequence No of composition	Roof composition from top to bottom	Minimum fire response class thermal insulation	Particularities	Fire resistance of the roof from the underside	Area limit (m^2)
1	-Roof foil B_{ROOF} (t1) -Thermal insulation -Parliamentary prison -concrete construction minimum REI30	E	Around the lights, drains or other penetrations through the roof should be installed min. 50 cm of non-combustible insulation Laid without air layer	REI 30 (ng)	Maximum 600 m^2 [3] and according to the size of the fire sector
2	-Roof foil B_{ROOF} (t1) -Thermal insulation -Parliamentary prison -Trapenic sheet	A1 or A2-s1,d0 or no insulation		nz	according to the size of the fire sector
3[4]	-Roof foil B_{ROOF} (t1) -Upper thermal insulation	Upper insulation D [1]	Laid without air layer	nz	Maximum 1,200 m^2 [3] and according to the size of the fire

	-lower thermal insulation with a minimum thickness of 10 cm -Parliamentary prison -Trapenic sheet	or B-s2,d0[2] Lower insulation A1 or A2-s1,d0			sector
4[4]	-Roof foil B_{ROOF} (t1) -Thermal insulation -Parliamentary prison -Trapenic sheet -Fire resistant coating $K_2$30 or EI30	D [1] or B-s2,d0[2]	Around the lights, drains or other penetrations through the roof should be installed min. 50 cm of non-combustible insulation Laid without air layer	$K_2$30 (ng) or EI30 (ng)	Maximum 1,200 m^2 [3] and according to the size of the fire sector
5[4]	-Roof foil B_{ROOF} (t1) -Thermal insulation -Parliamentary prison -sandwich panels of at least REI30 class	Thermal insulation: E [1] or B-s2,d0[2] Roof panel: B-s2,d0	Laid without air layer	REI30	Maximum 1,200 m^2 [3] and according to the size of the fire sector
6	-Roof foil B_{ROOF} (t1) -Thermal insulation -Parliamentary prison -Wooden load-bearing structure with sheets up to 25 mm thick on the load-bearing structure	A1 or A2-s1,d0 or no insulation		Nz	according to the size of the fire sector
7	-Roof foil B_{ROOF} (t1) -Thermal insulation -Parliamentary prison -Cross-glued wooden load-bearing structure REI30	E [1] or B-s2,d0[2]	Around the lights, drains or other penetrations through the roof should be installed min. 50 cm of non-combustible insulation	REI 30	a maximum of 1,200[3] and according to the size of the fire sector

Comments:
[1] It is not made of foamed or other dripping materials such as EPS, XPS.
[2] Classification of the reaction to fire of the heat-insulating product according to the end use based on the results of testing according to EN 15715
[3] Larger surfaces are possible if, in a band of at least 2 m, the combustible insulation is replaced by a non-combustible one.
[4] Composition not permitted above designated spaces 113, 121, 1264 and 1274
nz - No requirements
ng — non-combustible material

Example of implementation: In the case of a roof with combustible insulation and combustible waterproofing film, the basis must be the non-combustible fire resistance REI 30. However, the size of one field of such a roof shall be limited to 600 m^2. Every 600 m^2 it is necessary to make a 2 meter belt of non-combustible material. PVC film continues over a 2 meter strip of non-combustible insulation.

2.4.2.3 Sloping roofs

(1) Table 15 gives the minimum reaction-to-fire requirements for products from which sloping roofs are made. Sloping roofs include roofs with a slope of more than 10°.
(2) Notwithstanding Table 15, single-dwelling buildings located at a distance of at least 10 m from the relevant border and implemented as one fire sector shall also be permitted to have a top layer of class D or Froof (t1).
(3) In the case of fire separation of attic spaces (e.g. apartments), it is necessary to ensure fire separation also at the level of the roof structure.

Table 15: Minimum reaction-to-fire classes for sloping roof products

Consequence No of composition	Top layer	substructure (flying and surfing)	Additional insulation	Roof supporting structure (spirits, positions)	thermal insulation between the rafters and from the underside of the rafters	inner lining	limitation of the total roof area (m^2)
1	B_{ROOF} (t1)	E	E[1] or no insulation	E	E [1]	$K_2$30(ng) or EI 30[2]	For single-family houses up to 300 m^2
2	B_{ROOF} (t1)	E	D [1]	E	C [1]	ng	For single-family houses up to 300 m^2
3	B_{ROOF} (t1)	E	E[1] or no insulation	E	E [1]	AB plate or REI30 cross laminated plate	For single-family houses up to 300 m^2
4[5]	B_{ROOF} (t1)	E	A1 or A2-s1,d0 thickness minimum 6 cm	E	A1 or A2-s1,d0	Visible rafters, cladding $K_2$30 or ng	nz
5 [3] [5]	B_{ROOF} (t1)	E	A1 or A2-s1,d0 thickness minimum 6 cm or no insulation	E	E [1]	$K_2$30(ng) or EI 30[2]	600
6 [4] [5]	B_{ROOF} (t1)	E	E[1] or no insulation	E	C	$K_2$30(ng) or EI 30[2]	600
7	B_{ROOF} (t1)	E	A1 or A2-s1,d0 thickness minimum 6 cm or no insulation	E	A1 or A2-s1,d0	$K_2$30 or EI 30[2]	nz
8	B_{ROOF} (t1)	E	A1 or A2-s1,d0 thickness minimum 6 cm or no insulation	A1 or A2-s1,d0	A1 or A2-s1,d0	Nz	nz

[1] It is not made of foamed or other dripping materials such as EPS, XPS.
[2] Laid without air layer.
[3] It also applies to sandwich panels with double-sided metal cladding with classification C-s3,d0. The sandwich panel replaces the top layer.
[4] It also applies to sandwich panels with double-sided metal cladding with B-s2,d0 classification. The sandwich panel replaces the top layer.
[5] Composition not permitted above designated spaces 113, 121, 1264 and 1274
nz - No requirements
ng — non-combustible material

N.B.: The $K_2$30 or EI 30 inner lining must not be compromised by ventilation systems and other mechanical or electrical installations. In the case of penetrations, these must be protected by fire seals or be carried out in a fire-separate design from the wooden supporting structure, from combustible insulation or flying.

Example of implementation: Clay or concrete tiles fall under Directives 2000/553/EC and 2005/403/EC without testing in Broof(t1). In the case of metal roofing, it is necessary to check the suitability of the classification Broof(t1) in relation to the supporting composition of the roof.

2.4.2.4 Light bulbs in the roof

(1) Through the opening in the roof, which is made when the light ignites, a fire can pass through the roof, but burning drops or even larger particles of the burning light can ignite the combustible materials underneath it.

(2) Table 16 sets out the requirements for the reaction-to-fire class of the products of which the lamps are made.

(3) Notwithstanding the requirements of Table 16, the requirements for roofs in the vicinity of firewalls and the requirements to prevent fire transmission from a lower-lying roof to a higher part of the building shall be taken into account.

Table 16: Required classes of reaction to fire of roof lights and roof canopies on facades

Place of use	Buildings	
	Light elements in the roof	Light elements in canopies
Unrestricted use	A1 or A2-s1,d0	A1 or A2-s1,d0
In the rooms	Subject to the requirements of point 2.5.2	-
Protected evacuation routes	Subject to the requirements of point 2.5.2	-
In rooms with many users, where more than 200 people can gather, and in shopping streets in commercial buildings.	Class at least A2-s1,d0 In the case of a sprinkler system, at least B-s3,d0.	-
Use if it is at least 1 m away from neighbouring buildings and the canopy is constructed from non-combustible materials in a 2 m belt adjacent to the fire sector boundary.	-	at least E
Use if non-combustible material is used for the structure within 2 m of the fire compartment boundary.	-	at least C

2.4.2.5 Photovoltaic installations

When installing photovoltaic devices, it is necessary to ensure that the composition of the roof structure does not accelerate the spread of fire due to a fire at a solar power plant. In doing so, the requirements of SZPV 512 must be taken into account.

2.4.2.6 Green roofs

(1) Green roofs are separated into intensive or extensive greening. Intensive greening can be understood as resistant to flying butts and radiant heat. Extensive green roofs are considered to be resistant to flying butts and radiant heat if the resistance is proven by the SIST EN 13501-5 classification and in the following cases:

- At least 20% mineral content of the substrate
- Layer thickness minimum 30 mm

Example: The typical composition of such a roof is from the bottom up: load-bearing structure such as AB plate, vapour barrier, insulation, waterproofing, insulation protection, drainage layer, filter layer, substrate, vegetation.

In the case of intensive greening, it is very important to maintain such a roof, which mainly includes regular watering and arranging, which is also a condition for understanding that it is resistant to flying butts and radiant heat.

(2) Measures must be taken at the borders of the fire sectors to prevent the transmission of fire across the borders of the fire sectors. As an appropriate prevention, the following implementations can be considered:

- wall in a non-combustible version above the roof at a height of at least 30 cm
- separation with a minimum width of 1 m with a minimum of 5 cm pebble or concrete slabs

The requirements for the basic composition of the roof (the base of the green roof) remain unchanged.

(3) Green roofs should be divided into fields with a maximum width of 40 m. A separation zone with pebbles or concrete slabs with a width of at least 1 m should be carried out between the fields. Notwithstanding this requirement, an additional division into smaller fields is required in the case of fire sectors.

(4) A belt with a minimum width of 50 cm with pebbles or concrete slabs should be provided in the vicinity of dymood aerators and light domes.

(5) In the case of prevention of fire transmission from the lower part of the building in accordance with point 2.4.3.2 and a fire-resistant ceiling of the lower part of the roof is provided, a belt with pebbles or concrete slabs with a width of at least 50 cm at the junction of the roof and the higher part of the building must be provided.

2.4.3 Vertical fire transmission

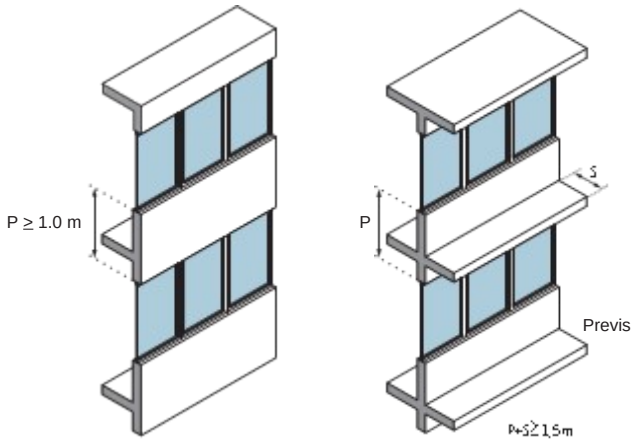
2.4.3.1 Fire transmission on the external wall of the building

(1) If external walls are not accessible for extinguishing from the outside of the building, and if other parts of this Guideline require additional requirements to limit the transmission of fire across the external wall of the building, the additional requirements in paragraphs 2 and 3 of this point shall be taken into account.

(2) If the building is fire-separated by a inter-storey structure, at the height of the inter-storey plate, the following must be carried out:

- a fire-resistant parapet with a height of at least 1 m, or
- a fire resistant overhang of at least 1,5 m width; or
- a combination of the two, giving a total of at least 1,5 m (see drawing 8).

The fire response class of such a facade shall be at least A2-s1,d0. The fire resistance of the parapet and overhang must comply with the requirements of points 2.2. and 2.3 of this technical guideline, respectively.



Drawing 10: Vertical spacing between windows in the outer wall of buildings

(3) Horizontal fire transmission across the façade between fire sectors shall be limited by a fire-resistant external wall at least 1 m wide between openings (e.g. windows), the fire response class of such façade shall be at least A2-s1,d0.

(4) The requirement of the two preceding paragraphs need not be complied with if AGS is installed in the lower and upper fire sectors.

(5) In so far as the façade is accessible for external fire-fighting, the requirements of points 2.4.1. shall be complied with.

2.4.3.2 Transfer of fire from the lower part of the building

(1) The transfer of fire from the lower part of the building to the fire-separated higher part of the building (see drawing 7) will be limited if the 5 m wide roof belt of the lower building or the 10 m high belt of the higher building has a fire resistance at least as high as required in points 2.2 and 2.3 of this technical guideline, respectively. In both cases, in addition to the fire resistance of the roof or external wall, non-combustible thermal insulation must be used in this belt.

(2) The requirements referred to in the preceding paragraph shall be reduced to RE 30 if AGS is installed in a lower building in the sense of full protection.

2.4.4 Transmitting fire horizontally

2.4.4.1 Transmission of fire across the inner corner of the building

(1) Where, owing to the shape of the building, the two fire-resistant surfaces in the outer wall of different fire sectors have an angle of 135° or less, the two fire-resistant surfaces shall be separated from each other in the manner set out in Table 17.

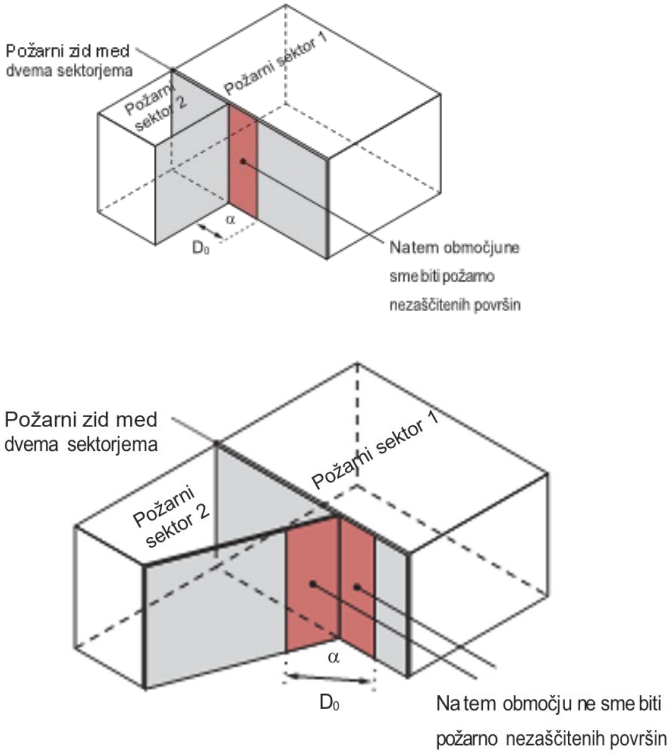
Table 17: Removal of unprotected surfaces from each other

Fire load	Required clearance between non-AGS fireproof surfaces on the outside of the façade	Required clearance between fireproof surfaces with automatic extinguishing system on the outside of the façade
Below 250 MJ/m2	1 m	1 m
above 250 and below 1000 MJ/m2	2,5 m	1,25 m
above 1,000 MJ/m2	5 m[1]	2,5 m

Note [1]: If an automatic extinguishing system is installed in the building, the offset can be reduced to half the distance.

(2) The offset between the openings shall be measured as a straight line between the openings D_0. The possibility of transfer to higher-lying floors should also be taken into account when determining the appropriate clearances, taking into account point 2.4.3.2.

(3) In the area between two fire-resistant surfaces in the inner corner (D_0), the facade classification must be at least A2-s1,d0 (non-combustible). The external wall in the zone according to drawing 11 at the border of the fire sectors shall have the fire resistance required for the sector with the higher fire resistance.



Drawing 11: Fire-resistant surfaces in the corner of the building

2.4.4.2 Fire transmission through and over the roof

(1) The requirements for preventing the spread of fire in this point refer to a fire from the underside.

(2) Fire transmission over the roof is prevented by the proper implementation of the contact of two fire sectors at the roof level. The design should be adapted to the type of wall, the supporting structure of the roof and the composition of the roof itself.

(3) In order to prevent fire transmission through and over the roof, the measures in CNGV 211 shall be taken into account.

2.5 BREAKDOWN BREAKING BY THE INTERNALITY OF THE BUILDINGS

The reaction-to-fire class for linings inside buildings shall be determined in accordance with SIST EN 13501-1.

2.5.1. Protected evacuation routes

(1) On protected routes, the minimum reaction class of linings to fire shall comply with the requirements in Table 18.

Table 18: Class of reaction of linings to fire

Space	In buildings with up to three floors		In buildings with more than three floors	
	Walls and ceilings	ground	Walls and ceilings	ground
corridors	C-s1,d0	D_{fl}-s1	A2-s1,d0	C_{fl}-s1
staircases	B-s1,d0	C_{fl}-s1	A2-s1,d0	B_{fl}-s1

(2) Notwithstanding the preceding paragraph of this point, linings on protected routes must:

- buildings with spaces for many users,
- buildings for health (CC-SI 1264),
- correctional centres, prisons, barracks, buildings for the accommodation of police officers and firefighters (CC-SI 12740),
- Special Purpose Buildings (CC-SI 113)
- industrial buildings (CC-SI 125) with hazardous chemicals (chemical industry),
- industrial buildings (CC-SI 125) with more than 600 MJ/m2 fire load,
- buildings for education and scientific research (CC-SI 1263),
- residential buildings with sheltered housing (CC-SI 11301)

meet at least fire response class A2-s1,d0 for walls and ceilings, at least class C_{fl-s1} for corridor floors and at least class B_{fl-s1} for staircase floors.

(3) On protected escape routes, cables shall have a fire response class in accordance with the requirements of point 2.5.4.

2.5.2. Lining in rooms

(1) Unless otherwise specified in this technical guideline, the minimum fire response class of walls without lining or cladding in rooms shall comply with the requirements set out in Table 19.

Table 19. Required fire-response classes of wall, ceiling and floor coverings for rooms according to the intended use of the space

Destination of premises in the building (CC-SI)[3]	In the rooms	
	Walls and ceilings	ground
11302 - Residential buildings for specific social groups (residential buildings for specific social groups, such as retirement homes, student and student dormitories, boarding schools, workers' dormitories, dependency dormitories, orphanages, monasteries, refugee centres, expatriate dormitories, maternity dormitories, shelters, etc.)	C-s1,d0[1]	C_{fl}-s2
121 - Catering buildings	C-s1,d0[1]	C_{fl}-s1
1241 – Terminals at airports, train and bus stations, …	C-s1,d0	B_{fl}-s1
1242 - Garage buildings with more than 10 parking spaces	A2-s1,d0	B_{fl}-s1
125 - Industrial buildings and warehouses with hazardous chemicals (chemical industry) or a fire load equal to or greater than 1000 MJ/m2	A2-s1,d0	B_{fl}-s1
1261 - Culture and entertainment buildings (theatres, event halls, discos, ...)	C-s1,d0[2]	D_{fl}-s1
123 - Commercial and other buildings for service activities	C-s1,d0[2]	C_{fl}-s1

1263 - Educational and scientific research buildings, if multi-storey	C-s1,d0[2]	C_{fl}-s1
1263 - Education and scientific research ground floor buildings	D-s2,d0[1]	C_{fl}-s1
1264 - Health care buildings where people can be evacuated without foreign assistance	C-s1,d0	C_{fl}-s1
1264 – Health care buildings where people cannot evacuate without foreign assistance	A2-s1,d0	B_{fl}-s1
1274 - Other non-residential buildings such as re-education centres, prisons, barracks, buildings for the accommodation of police officers, fire stations, buildings for the accommodation of protection, rescue and relief forces, covered military and similar shooting ranges, shelters	A2-s1,d0	B_{fl}-s1

[1] Solid wood coverings are allowed.
[2] Solid wood coverings of the D-s2,d0 classification, laid without an air layer, are allowed. If the wood covering belongs to class B-s1,d0, an air layer is allowed.
[3] If the building or the space in the building also meets the criteria for spaces for many users, see the requirements of the second paragraph of this point.

(2) Regardless of the intended use of the spaces in Table 19, the minimum fire response class of the linings in the spaces shall meet the requirements of Table 20 for a large number of users. Where evacuation routes from spaces pass through a lobby or vestibule for a large number of users, the same requirements shall apply to those spaces.

Table 20: Minimum permitted fire response class of linings in rooms for a large number of users

Size of the room	No sprinkler system		With sprinkler system	
	Walls and ceilings	ground	Walls and ceilings	ground
Spaces up to 1,000 m^2	B-s1, d0[1]	B_{fl}-s2	C-s2, d0[1]	C_{fl}-s2
Spaces greater than 1,000 m2	A2-s1, d0	$A2_{fl}$-s1	B-s1, d0	B_{fl}-s1

[1] Permitted wood coverings of classification D-s2,d0, laid without air layer. If the wood covering belongs to class B-s1,d0, an air layer is allowed.

(3) Regardless of the intended use of the spaces in Tables 19 and 20, the class of reaction to fire of linings in basement spaces shall be at least C-s2, d0 and the insulation material shall be at least E.

(4) Notwithstanding the preceding paragraph of this point, wooden floor coverings of classification C_{fl}-s2 are permitted on sports hall playgrounds (CC-SI 12650), on stages of buildings for culture and entertainment (CC-SI 12610) and in similar cases.

(5) Notwithstanding the provisions of this point, wall and ceiling decorative films which are not directly attached to walls or ceilings (e.g. hollow space behind them) shall comply with the requirements of Table 19 for spaces and Table 21 for spaces with many users and for protected escape routes. Tensioned ceilings may be installed only on condition that they meet the requirements of this point in relation to the intended use of the space.

Table 21: Requirements for wall and ceiling decorative foils in rooms for many users and protected evacuation routes

Destination of space	No sprinkler system	With sprinkler system
Spaces for many users	A2-s1, d0	B-s1, d0
protected stairways and protected corridors	A2-s1, d0	A2-s1, d0

(6) If there are spaces of different uses in a building, the lining inside the spaces must be of a material appropriate to the purpose of the space, and the lining on escape routes must be of a material appropriate to the highest requirement for a particular use within the building or within that part of the building which is bound to the escape route under consideration.

(7) When establishing the requirements for ceiling coverings, the requirements for walls and roofs according to point 2.4 shall also be taken into account.

(8) The requirements set out in respect of Tables 18, 19, 20 and 21 shall apply to all layers on the wall or ceiling, except for vapour-permeable or vapour-porous films (e.g. films having a thickness of less than 1 mm and closed on all sides with materials meeting the requirements). A layer which is at least (R)EI 30

fire-separated from the inner lining may have a poorer reaction to fire.

Example of inadequate ceiling composition in a commercial building with more than 100 people (from the bottom up):

- *trapezoidal sheet*
- *steam prison*
- *EPS insulation*
- *waterproofing film*

EPS – insulation has worse properties than required according to point 2.4.2.2 and would therefore only be allowed in case of fire resistant non-combustible ceiling minimum REI 30.

(9) The substructure of the lining should be made of non-combustible materials. Wooden substructure is allowed only in the case when a wooden wall or ceiling covering is allowed.

2.5.3 Insulation in prefabricated partitions

(1) In buildings where combustible construction is allowed, the use of combustible insulation in lightweight partitions is also allowed.

(2) For buildings where protection of a wooden structure is required in point 2.2 or 2.3 in accordance with CNGV Guideline 414, non-combustible insulation shall be used in partitions.

2.5.4 Cables in rooms

(1) On the protected parts of the escape routes, the cables shall meet the requirements of Class B2ca s1 d1 a1 or be laid in accordance with CNGV 408 (e.g. under plaster). Cables in rooms shall have a reaction to fire according to Table 22 according to the intended use of the space.

Table 22: Requirements for cables

Type of building or part of a building (CC-SI)	**Minimum fire response class for built-in electric cables without AGS [1]**	**Minimum fire response class for installed electrical cables with AGS according to point 2.9[1]**
1110 - Single-dwelling buildings 112 - Multi-apartment buildings	E_{ca}	E_{ca}
125 - Industrial buildings and warehouses up to 250 MJ/m2 1271 - Non-residential agricultural buildings	E_{ca}	E_{ca}
11302 - Residential buildings for other specific social groups 121 - Catering buildings 123 - Merchant and service buildings 1241 - Station buildings, terminals, communication buildings and associated buildings 1261 - Culture and entertainment buildings 1262 - Museums and libraries 1263 - Education and scientific research buildings 1265 - Sports buildings 1272 - Ceremonial buildings (religious buildings, cemetery buildings)	C_{ca} s1 d2 a1	C_{ca} s1 d2 a1
11301 - Residential buildings with serviced housing 122 - Commercial and administrative buildings 1242 - Garage buildings 125 – Industrial buildings and warehouses above 250 MJ/m2 and VRS 1264 - Health care buildings where people can be evacuated without foreign assistance 1273 Cultural heritage not otherwise used 1274 other buildings n.e.c.	C_{ca} s1 d2 a1	E_{ca} s1 d2 a1
1264 – Health care buildings where people cannot evacuate without foreign assistance	$B2_{ca}$ s1 d2 a1	$B2_{ca}$ s1 d2 a1

Rooms with a large number of people, gathering places	C_{ca} s1 d2 a1	C_{ca} s1 d2 a1
High-rise buildings	C_{ca} s1 d2 a1	C_{ca} s1 d2 a1

[1] Protected evacuation routes shall comply with the first paragraph of this point in all buildings.

Example: The building is one of the most fire-prone buildings. In the building there is a garage, commercial activity and medical activity on the ground floor and on the floors of the apartment. Cables for apartments run through the garage. In the garage there must be cables Cca s1 d2 a1. Since the cables for apartments pass through the garage, the cables must be Cca s1 d2 a1 or Eca and protected in accordance with CZPV guideline 408. Cables in medical use (where people can be evacuated without foreign assistance) and cables in the commercial part must be at least Cca s1 d2 a1.

(2) Cables must be installed in accordance with the requirements of CNGV Guideline 408. Notwithstanding the requirements of Table 22, Eca cables may be installed:
- in less fire-retardant buildings,
- inside fire-protected shafts or ducts,
- within fire-separated energy spaces.

(3) Cables in wooden buildings must be carried out in accordance with the requirements of SIST HD 60364 – 4 – 42 and SIST HD 60364 – 5 – 52.

2.5.5 Gas installations

(1) Gas installations and installations shall not be located within protected evacuation stairways and protected exit corridors from those stairways. Gas installations and installations may take place within protected corridors provided that they are fire-separated from protected stairways.

(2) A gas fire faucet must be installed on the facade. It must be marked with the inscription: It's a firefighter's palate.

(3) Pipe installations must be installed in accordance with the requirements of CNGV Guideline 408.

(3) In addition to the requirements of this technical guideline, the requirements of the technical guideline for gas installations DVGW TRGI shall apply to natural gas installations.

(4) In addition to the Regulation on liquefied petroleum gas and the requirements of this technical guideline, the requirements of the technical guideline for the installation of liquefied petroleum gas DVFG TRF shall apply to gas installations with liquefied petroleum gas.

(5) If the gas consumers are:

- a gas stove (possibly also in a cascade) with a total power of more than 100 kW and the boiler room is accessible from inside spaces (e.g. it does not have access directly from the outside with adequate fire separation from the rest of the building)
- Kitchen consumers with more than 50 kW of installed power
- Class 1263 classrooms and laboratories – Education and scientific research buildings

gas detectors must be installed in consumer areas.

(6) If the gas installation takes place on the premises inside the building (e.g. it does not take place on the façade and directly into the boiler room space) and the building requires the installation of an AJP system in accordance with point 3.5, an automatic shut-off valve must be installed at the gas supply before entering the building, which is controlled by the AJP system.

2.6 SAFETY PROTECTION OF TRANSITIONS THROUGH THE SAFETY WINDOW

2.6.1 Fire doors

(1) Fire doors must provide adequate protection for openings in firewalls. Unless otherwise specified in this technical guideline, fire doors shall have the same fire resistance as the wall in which they are installed. The classes of reaction-to-fire performance are set out in SIST EN 13501-2. For the purposes of this technical guideline, the classes of reaction-to-fire performance given in Table 23 shall apply.

Table 23: Classes of fire resistance

E	30	60	90	120
EI_1	30	60	90	120
EI_2	30	60	90	120
EW	30	60		

(2) Where combustible linings of walls and ceilings are also permitted on protected escape routes (hallways or stairways), the doors shall have the classification EI_1.

(3) The designer may also determine the smoke-tightness of the door, which may be required as an independent feature of the door only to reduce the passage of cold or hot smoke (classification S_{a3}, S_{a4} or S_{200}).

(4) In rooms with very low fire load (< 250 MJ/m ^{2}), it is allowed to install EW-classified doors in place of EI-classified doors, but of the same time class (e.g. EI_2 30-Cx doors EW 30-Cx).

(5) Unless otherwise specified in this technical guideline, fire doors must be equipped with a self-closing device which must operate throughout the service life of the door and therefore, when requiring the fire resistance of the door, the durability of the self-closing device must also be determined in relation to the intended use of the door. The guidelines for determining the class of the self-closing device are defined in Table 24.

Table 24

Class (Cx)	Examples of intended use	Number of closing test cycles over the lifetime of the door (expected to be 10 years)
C5	very common use	200.000
C4	high frequency of public use in buildings where users are not expected to handle doors carefully	100.000
C3	mean frequency of use in buildings where users are expected to handle doors normally	50.000
C2	low frequency of use in buildings where users are expected to handle doors carefully (e.g. private dwelling doors, large industrial doors)	10.000
C1	Doors that are normally in the open position	500
C0	Use not specified	0

Example 1: Classification of doors to the apartment, which must have a fire resistance of 30 minutes, and the wall cladding in the hallway is made of combustible material: EI_1 30-C2.

Example 2: Classification of the door to the staircase, where smoke-tightness is also required through the floor barrier: EI_2 30-C5,S_{200}.

2.6.2 Installation shafts, ducts and audit apertures

(1) The fire resistance of the protection of the passages of the installations must be equal to the fire resistance of the building element through which the installation passes.

(2) Installation shafts, ducts for electric cables and the like which pass through the boundaries of the fire sector shall have the same fire resistance as required for other building elements of the fire sector and shall be smoke-tight. If they are not smoke-tight (e.g. fire doors EI_2 90-C3 without smoke-tightness or only with ambient smoke-tightness EI_2 90-C3,S_{a3} or EI_2 90-C3,S_{a4}), they shall have a hole at the top of the shaft in a free size of at least 5 % of the shaft surface but not less than 0,2 m ^{2}.

(3) If the requirements of the preceding paragraph of this point are not met, the installation shafts at the boundaries of the sectors must be interrupted by fire resistance elements as defined in CNGV Guideline 408.

(4) The inspection apertures shall have the same fire resistance as required for the building element in which they are installed. If fire-resistant doors are installed instead of audit openings on protected escape routes,

the doors shall be in addition to classification EI_1 tt or EI_2 tt also smoke-tight with classification S_{200}.

(5) Pipeline and installation passages through fire-resistant walls must meet the requirements of CNGV 408.

(6) The requirements for flue ducts are set out in CNGV Guideline 407.

2.6.3 Ventilation ducts

(1) This point applies to ducts of ventilation devices which are not intended for the extraction of smoke and heat. For ODT channels, see point 2.8.

(2) Fire dampers or fire valves (where applicable mutatis mutandis) with at least the fire resistance required for other building elements of the fire sector shall be installed at the passages of ventilation ducts through the boundaries of the fire sectors. Fire dampers shall have a classified fire resistance EI tt (i<->o)S, where tt denotes the time criterion of the duration of the fire protection. Fire dampers must be marked and manufactured in accordance with SIST EN 15650. (i<->o) means the transfer of a fire from the inside of a channel outwards and vice versa from the outside to the inside of a channel. The installation and sealing of the passage of fire dampers across the boundaries of the sectors shall be in accordance with the testing and documentation of the fire damper manufacturer. It is not allowed to pass other installations through the sealing system of the fire damper. The connection and implementation of ventilation ducts to the fire damper shall be carried out in accordance with ÖNORM H 6031 or in accordance with the examples given in CZPV Guideline 406.

(3) Fire valves and transitional fire grilles can be used to ventilate smaller spaces up to 10 m^2, such as cleaning rooms, energy spaces. Fire valves and fire dampers not controlled by the AJP system shall not be used at the boundaries of fire sectors adjacent to:

- protected stairways; or
- Spaces for many users.

Passing fire grilles must provide the same fire resistance as prescribed for the wall or ceiling. They are used for installation in firewalls, where the passage of air with a difference in pressure is ensured. These grilles should not be used in conventional forced ventilation systems.

(4) Ventilation ducts which pass through another fire sector without openings in it may be fire-resistant or may be protected by a fire envelope with at least the two-sided fire-resistance required for the sector through which they pass. In this case, the installation of fire dampers at the border of the fire sector is not required (if the channel does not connect two different fire sectors). Channels must have the SIST EN 13501-3 classification and the classified fire resistance EI tt(i<->o) S, where tt denotes the time criterion of the duration of fire protection and s (i<->o) denotes the transfer of fire from the inside of the channel outwards and vice versa from the outside to the inside of the channel. Other off-label installations may not be used in ventilation ducts.

(5) Fire dampers and fire valves must have a thermal actuator for autonomously actuating the closing mechanism. The fire damper or fire valve shall not be used as a control damper. Fire cuffs or straps shall not be used in place of fire valves or fire dampers.

(6) In buildings with purposes such as 121 - hospitality buildings, 1241 - station buildings, terminals, communication and related buildings, 1261 - buildings for culture and entertainment, 1262 - museums and libraries, 1263 - buildings for education and scientific research, 1265 - buildings for sports, 123 - commercial and service buildings, 1272 - ceremonial buildings (buildings for religious services, cemetery buildings), 11302 - residential buildings for other specific social groups, 1264 - buildings for medical care, buildings with premises for many users and where the AJP system is required, fire dampers must also be activated through the AJP system. This provision does not apply to fire valves and transitional fire grilles which are designed to extract air from small spaces with a fire load below 250 MJ/m^2 and which have a dedicated, fire-separated ventilation system (e.g. sanitary facilities). If the installation of an AJP is required in a building, the fire valves must be able to report the condition to the fire switchboard. Notwithstanding these requirements, the requirements of paragraph 3 shall be complied with.

(7) The ventilation system shall be automatically switched off when the AJP or AGS or the fire damper is activated, unless technological or operational conditions require a different operating regime. In the event of failure of the AJP or AGS, it must also be possible to manually switch off the ventilation system.

(8) Ventilation ducts must be made of non-combustible materials. This requirement does not apply to:

- channels with aggressive media (at least class B or C);
- walled canals (they must fit at least class B or C),
- ducts in single-family buildings where the air temperature is below 40 °C (at least class B or C) excluding ducts from domestic range hoods,
- channels laid in the ground (they must correspond to at least class B or C).

(9) Thermal insulation of ducts must be non-combustible or of hard-to-combustible material (classes A1, A2, B or C). Exceptions may be outdoor ducts provided that they are additionally lined with non-combustible material with a thickness of not less than 0,5 mm.

(10) Notwithstanding the preceding paragraph, ducts and their thermal insulation (including vapour barriers, foils, coatings and linings) shall be of non-combustible materials:

- evacuation routes (protected corridors, stairways, etc.),
- above the suspended ceiling, which is installed to increase the fire resistance of the structure,
- if the air temperature is higher than 85 °C,
- if there could be a build-up of combustible material on the walls of the canal (kitchens, carpentry workshops and the like).

Vapour barriers, foils and linings may be of normally combustible material (Class E) if they are thinner than 0,5 mm.

(11) There are no fire response requirements for smaller parts such as seals, bearings, measuring devices, insulation of electrical and pneumatic devices, filters, and for other parts of ventilation devices that have a small impact on fire safety.

(12) Flexible ducts are permitted only within the same fire sector for the connection of individual devices such as diffusers, fans, etc. Flexible hoses with a maximum length of 4 m and a minimum length of Class C are permitted for suction machines.

(13) For additional requirements for ventilation ducts, the CNGV guideline IZS 406 and the SIST EN 15423 standard shall apply.

(14) The air intake for ventilation of a building with many users should be carried out in such a way that it contains a smoke sensor that detects smoke at the air intake and subsequently switches off the ventilation.

2.6.4 Dilatations

Building gaps and joints (fuges), on and between elements of the fire sector shall be fire sealed for at least the same duration of the fire as specified for the boundary of the sector. The fire resistance of the sealing system for dilations must be classified according to SIST EN 13501-2, with the classification EI tt. The additional markings provided for in the classification standard must correspond to the conditions of the building, also taking into account the possibility of expansions between the slots.

2.7 SPECIAL SPECIAL SPECIAL SPECIES IN STATIONS

2.7.1 Elevators, shafts and vestibules of lifts

(1) Where the lift is in the fire sector of a protected staircase, the shaft doors shall not open to spaces other than that of the staircase. If the lift is not in the fire sector of a protected staircase or a protected corridor, but its floor doors open to these spaces, it must meet the requirements of the fourth paragraph of this point or an automatic fire door must be installed in front of the floor doors in accordance with drawing 11.

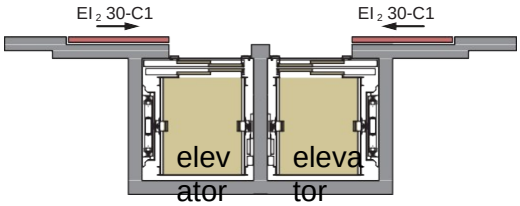
(2) At the top of the shaft there must be an opening for the separation of the shaft. An opening of at least 5 % of the area of the shaft, but not less than 0,16 m^2, shall lead to the open air. The opening can be permanently closed if an automatic opening is performed via the AJP system and smoke detection inside the shaft. The requirements for lifts may be reduced to an aperture size of at least 1 % of the area of the shaft and may be directed to the same fire sector inside the building:

- for lifts located in the fire sector of a staircase and fitted with a drift system in the staircase,
- for lifts located within one fire sector.

(3) The machinery space of the lift must be fire-separated from all other spaces (except the hoist shaft) with the same fire resistance as required for the supporting structure, but not less than (R)EI 30.

(4) Hoist shaft doors and hoist shaft maintenance doors shall be made of non-combustible materials. If lifts are opened to another fire sector (e.g. corridor, apartments, offices, industrial halls, warehouses), they must have a fire resistance of at least EI 60 and have been sent away in accordance with the requirements of the second paragraph of this point.

(5) For requirements for lifts in buildings equipped with a fire alarm and alarm system (AJP) or a sprinkler system, see point 3.2.3.8. For requirements for firefighter lifts, see also point 4.3.2.



Additional automatic fire doors according to SIST EN 1634-1 between the elevator floor doors and the protected corridor

Drawing 12: Example of fire separation of the lift from the protected staircase

2.7.2 Pressure booster pump space, generator space

(1) The space for increasing the water pressure for the hydrant network shall have walls and doors with the same fire resistance as required for the load-bearing structure or as required for the operation time of the hydrant network. The same requirements apply to the aggregate space.

(2) Inlet and outlet openings for an aggregate space must lead directly to the open air or through suitable fire ducts through other spaces to the open air and must not be connected to ventilation openings of other spaces.

2.7.3 Combustion plant rooms

In addition to the Rules on the requirements for the installation of combustion plants, notwithstanding the requirements of point 2, for rooms with combustion plants using solid fuel, fuel oil, gas, biogas, etc., the requirements of CNG Guidelines 407 shall be fully complied with.

2.7.4 Double-floored spaces

(1) In protected stairways and protected corridors, all parts of the double floor must be of non-combustible material. Flooring requirements must also be taken into account. Finishing dilations must be finished with non-combustible materials. In the load-bearing floor board, only fire-protected breakthroughs can be made. The double floor shall be of a fire-resistant design at least as required for the supporting structure of the building.

(2) In other rooms, fire resistance plates of at least REI 30 shall be installed at double floor heights above 500 mm.

(3) The double floor shall be interrupted at passages through the border of the fire sector, the protection of the passage shall be at least equal to the requirement of fire resistance at the border of the fire sector.

2.7.5 Spaces with electricity installations

(1) Notwithstanding the other requirements of point 2 of this Technical Guideline, spaces with power transformers shall be implemented as separate fire sectors with the same fire resistance as required for other fire sectors of the building, but with a minimum (R)EI of 60. Air inlet and outlet openings for spaces with transformers must lead directly to the open air or through appropriately fire-executed ducts through other spaces to the open air and must not be connected to ventilation openings of other spaces. Fire-separated from transformers and other rooms are also high-voltage rooms.

(2) Notwithstanding the preceding paragraph, the fire resistance of the walls of a transformer installation room with an insulating liquid volume of more than 1,000 l and an insulating liquid flashpoint below 300 °C shall

be minimal (R)EI 90. If such a room is shielded by an automatic extinguishing system, the required fire resistance shall be at least (R)EI 60.

(3) Notwithstanding the first paragraph, dry transformers of fire behaviour class F1 according to SIST EN IEC 60076 – 11 may be installed in industrial buildings (CC-SI group 125) with a non-combustible load-bearing structure and walls and a specific fire load below 500 MJ/m ^{2} without fire separation. The separation distance from the transformer, inside which there should be no combustible substances, is 0.9 m horizontally and 1.5 m vertically.
(4) In rooms with high voltage energy installations, walls and ceilings shall be made of materials with a fire response class of at least A2-s1,d0 and floors of at least class B $_{fl-s1.}$
(5) For additional requirements, SIST EN 61936-1 shall be taken into account.

2.7.6 Ventilation facilities

(1) Ventilation devices intended for a single fire sector may be installed at will within the fire sector they ventilate.

(2) Ventilation devices intended for several fire sectors shall be installed in a fire-separated space with at least the same fire resistance as required for ventilated sectors. For additional requirements for rooms with ventilation devices, CNGV Guideline IZS 406 shall apply.

(3) Notwithstanding the requirements of the second paragraph of this point, a ventilation device may be situated within the fire sector of the space it ventilates, provided that:

- ventilation intended also for smaller fire-segregated spaces of up to 100 m ^{2},
- ventilation system intended for several fire sectors on the same floor in the case of classification 122 Commercial and administrative buildings and 125 Industrial buildings and warehouses.

The fire separation requirements remain unchanged.

2.8 DIMENSION OR CONTROL AND TOPLOTE

2.8.1 General

(1) Smoke is more dangerous than fire in the first phase of a fire. By draining or controlling smoke and temperature, we ensure safe evacuation routes, enable firefighters to operate more efficiently, protect property to a certain extent and protect the environment from excessive pollution caused by fire. Devices for the extraction or control of smoke and heat are installed where they can achieve the basic purpose of protection in the event of fire.

(2) The objectives of smoke and heat extraction or control are:
- protection of building users,
- support firefighters in firefighting and also
- security of buildings.

(3) Smoke and heat extraction or control devices shall be installed in larger spaces and stairways as specified in point 2.8.4 or in other points of this Technical Guideline. If feasible, use NODT, otherwise MODT with fans. The requirements for the extraction or control of smoke and heat are determined according to the use of the space, regardless of whether the common classification of the building is different.

(4) Depending on the space and purpose, the following smoke and heat extraction or control systems are required:
- Smoking by natural ventilation or using mobile ventilators (2.8.2.1)
- smoke dilution by ventilation systems (2.8.2.2),
- a simple natural or mechanical smoke and heat extraction system dimensioned according to the requirements of this Guideline (2.8.2.3),
- more complex natural or mechanical smoke and heat evacuation, dimensioned according to guidelines or standards for smoke and heat evacuation planning (2.8.2.4),
- overpressure smoke control (2.8.2.5).

(5) The geometrical area of the smoke outlet or air inlet hole (see drawing 13) shall be determined using the

formula

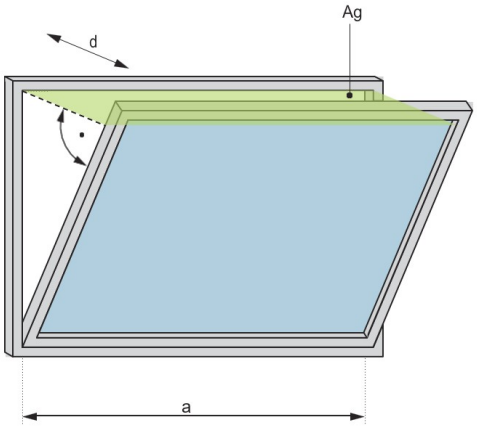
$A_g = a \times d$

where it is

A … geometrical surface of the opening,

a … bright width/light height,

d … is the perpendicular distance from the edge of the groove parallel to the axis of rotation to the plane of the open wing.



Drawing 13: Sketch for calculation of the geometrical area of the smoke outlet

At an opening angle greater than 90 degrees, A_g is equal to the size of the window or door.

(6) The aerodynamic surface area is determined for each aerator separately according to the SIST EN 12101 standard.

(7) The use of ventilation devices is permitted in the event of fire, provided that they also meet all the requirements for ODT.

2.8.2 Equipment and installation requirements

2.8.2.1 Basic requirements for respiration

(1) In specific cases (referred to in point 2.8.4 or in other points of this technical guideline) where simplified smoke and heat extraction is permitted, they replace the function of fire aerators of the smoke aperture. They are primarily intended to support firefighters in extinguishing and are mainly used in combination with mobile fans. These are openings in facades, roofs, shafts, canals (including windows and doors), which lead directly to the open air and allow natural extraction of smoke and heat. They must be installed in the upper half of the outer walls of the room or in the ceiling or roof. For air supply, at least the same area in the lower half of the walls of the room must be provided, which must be suitable for the placement of mobile fans.

N.B.: Enclosed spaces with no openings for the supply of fresh air via mobile fans cannot be counted among the rooms that allow smoke. The peculiarity without inlet openings can only be considered to be drifting out of the lifting shafts.

(2) The mechanisms for opening the separation openings shall be easy to operate and accessible from an easily accessible place at all times. If easy manual opening cannot be ensured, manual electrical (or pneumatic) opening via manual keys or automatic opening via AJP or via thermal ampoules on aerators shall be provided. On staircases, manual opening or manual electrical control via dipping keys is used (the use of automatic opening via thermal ampoules on the window or dome is not allowed).

(3) A back-up power supply shall be provided in accordance with point 2.10.

(4) If windows or domes are used for respiration, compliance with SIST EN 12101-2 is not required for these openings.

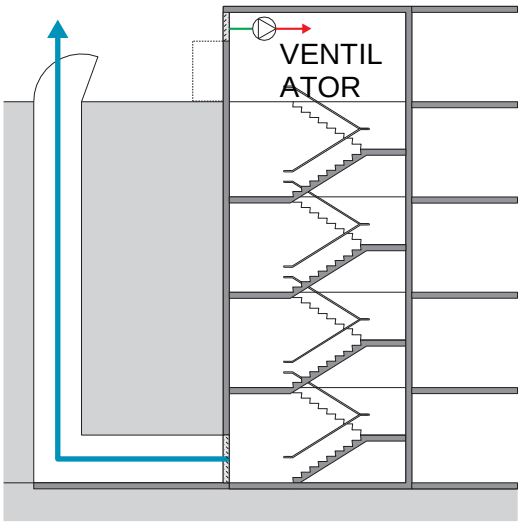
2.8.2.2. Basic requirements for mechanical ventilation for smoke dilution

(1) Appliances are intended for staircases, corridors and spaces where it is not possible to provide natural smothering or natural drainage of smoke and heat. They are mainly used in protected basement and inner-lying staircases.

(2) Adequate ventilation primarily dilutes smoke that penetrates the hallway or staircase, but it is not ensured that smoke is completely prevented from entering the evacuation routes. The supply fan establishes a small overpressure in the ventilated space, but in any case this overpressure should not be more than 50 Pa. The force of opening the door together with the self-closing device must not exceed 100 N. The condition of operation of the fan is open drainage blinds or flaps.

(3) The air supply must be at the level of the ground floor, the air outlet from the staircase must be from the lowest (for basement staircases) or the highest part of the staircase (for above-ground staircases). Turning on or off must also be manual, at the entrance to the staircase and separated for the underground part and the above-ground part. The switch must be protected against misuse and with appropriate inscription, e.g.: MECHANICAL TREATMENT OF THE CROSS-BORDER - MAY BE USED ONLY BY THE GASILEC. The operation such as system activation, normal state, system failure shall be visible to the switch. The system does not automatically switch on via the fire alarm system. A fire key and a fire vault can be used to prevent abuse.

(4) An example of the implementation of ventilation of the underground staircase is shown in drawing 13.



Drawing 14: Example of the implementation of ventilation of an underground staircase

(5) A back-up power supply shall be provided in accordance with point 2.10. Electric cables shall be fire resistant in accordance with the requirements of point 2.10.

(6) The dilution system shall function as a stand-alone system, including the control of any blinds, flaps or other devices that are an integral part of the system. The system shall be connected to the fire reporting system in terms of control of system readiness for use (fault control).

2.8.2.3 Basic requirements for simple ODT systems

Air supply

(1) Apertures in facades located in the lower half of the height of the room are considered to be air supply surfaces. For this purpose, in addition to special openings, doors and windows that can be opened without damage or with conventional fire-fighting tools can be used.

(2) If ODT is used for the safety of evacuation routes (premises for many users, shops), the inlet openings must be automatically opened together with the openings for NODT or MODT.

(3) In the case of MODT, the constructed size of the inlet ports must be provided. If circumstances make it impossible to supply by means other than ducts, they must provide the same fire resistance as in the sectors they cross and in the last protected sector. The use of fire dampers in these channels is not allowed. The use of dimode dampers is allowed.

(4) Unless otherwise specified in this Guideline, supply surfaces shall have at least the same geometric size as drainage surfaces. In the case of MODTs, inlet ports shall be provided in such a size that the air velocity at the inlet does not exceed 3 m/s and 6 m/s in the ducts.

Triggering of ODT devices

(1) As a general rule, ODT devices are triggered automatically by a smoke detector via an AJP or by a sprinkler system (interaction to be considered, see point 2.8.3). In any case, it must also be possible to manually activate from a safe position, as a rule at the exit door, but this requirement does not apply when using a fire-fighting system that requires different activation of the DT (e.g. in a fast-acting sprinkler system – ESFR or in a VRS).

(2) Additional manual actuators shall be installed when the space furthest from the base actuator is more than 40 m. The case shall be grey or orange in colour with the inscription ODVOD DIMA IN TOPLOTE and the position of the actuator (open/closed) shall be recognisable. If several buttons for different systems are installed in the same location, a graphical display of the operating areas or a text code of the area must be installed accordingly.

Fire aerator for NODT

In addition to the general requirements for closing openings on buildings, the fire aerator must also meet the fire requirements for NODT. Performance requirements are set out in SIST EN 12101-2. The planning should also take into account the local climatic conditions on which snow, wind and temperature loads depend, as well as requirements for reliability, thermal resistance and classification of building materials.

Fans for mechanical smoke and heat extraction (MODT)

(1) The MODT fan must be constructed in such a way as to allow smoke and heat to be dissipated over the time and temperature range provided for the operation of the ODT. Performance requirements are set out in SIST EN 12101-3.

(2) In the case of an integrated sprinkler system, fans shall meet the requirement of at least F_{200} for two hours of operation, and in the case of no sprinkler system, fans shall meet the requirement of F_{400} for at least two hours of operation.

Smoke extraction ducts

(1) Ducts for the extraction of smoke and heat can be single- or multi-sector. The time or time criterion for fulfilling the required fire resistance must be the same as the time of fire resistance of the sector from which smoke and heat are discharged. However, in the case of multi-sector ducts, this time in the part where the duct passes through other fire sectors shall be at least equal to the time required for the boundaries of those fire sectors. Smoke extraction ducts shall also be suitably dimensioned and classified to an overpressure of 500 Pa or a underpressure of 500 Pa, 1000 Pa or 1500 Pa, according to SIST EN 13501-4.

(2) The outlets and inlets on the ducts must be evenly spaced to allow ventilation of the entire space. The traction shall be dimensioned in such a way as to create a vacuum or overpressure in the room of not more than 10 Pa (the force of opening the escape doors or the requirements of fire/smoke curtains shall be taken into account), without creating air currents and eddying and smoke retention.

(3) Fire resistance of multi-sector channels must be class EI tt S multi according to SIST EN 13501-4, where tt denotes the time criterion, other channel classification codes depend on the system and method of installation.

(4) Fire resistance of single-sector channels must be at least E_{600} tt, single according to SIST EN 13501-4, unless otherwise specified by calculation MODT according to DIN 18232-5, where tt denotes the time criterion, additional channel classification codes depend on the system and method of installation. A comparison between the classes according to DIN 18232 – 5 and fire resistance according to SIST EN 13501 – 4 is provided in Table 25.

Table 25: Comparison between classes according to DIN 18232-5 and classes of reaction-to-fire performance according to SIST EN 13501-4

DIN 18232 – 5	SIST EN 13501 – 4
Category 1	E_{300} tt $_{single}$

Category 2	E_{600} tt $_{single}$
Category 3	EI tt S_{multi}

tt-time criterion

(5) Smoke dampers must be installed at the boundaries of fire sectors or duct inlets, which may be single-sector or multi-sector depending on where they are installed. Smoke dampers must have a classified fire resistance in accordance with SIST EN 13501-4, equal to or greater than the dimode duct into which they are installed, where the classification for single-sector dampers is at least E tt single or at least EI tt S multi for multi-sector (tt indicates the time criterion), the rest of the classification marks of smoke dampers depend on the installation system.

Smoke curtains and smoke sector

Smoke curtains are designed to contain smoke in the smoke sector, and in special cases to channel smoke and enhance the operation of ODT. They can be carried out as a building element or as a built-in technical means (automatic smoke curtains). The smoke sector must not exceed 1 600 m^2, and the length or width of the smoke sector must not exceed 60 m. The curtain as a building element must be made of non-combustible materials of class A1 or A2-s1,d0, a curtain made of glass of classification at least E 30. Requirements for automatic smoke curtains are set out in SIST EN 12101-1. This requirement is taken into account if required by other parts of this Guideline.

Drainage openings

Drainage openings include domes, windows or other openings intended for the extraction of smoke and heat and openings to the free of mechanical smoke and heat extraction. Openings shall not obstruct escape routes and shall not endanger adjacent buildings or other fire sectors.

Power supply

The back-up supply of mechanical smoke and heat extraction must ensure operation for at least one hour. For requirements see point 2.10. Windows and domes opened for the purpose of unblocking or NODT must remain in their final position in the event of a power failure. The backup power supply shall be dimensioned for opening and closing at least 3 times.

Operation of the system

The smoke and heat control system must function as a stand-alone system. The system consists of various components such as drain holes or fans, inlet holes such as windows, blinds and doors, and possible control devices such as flaps. All devices are connected via cables to one or more electrical cabinets. The regulation of the openings must not be carried out through the fire control unit (the appropriate solution is the installation of a control unit or control cabinet that controls the outlets and the inlets). This means that the smoke and heat control system must act as a single system (e.g. even in the event of a failure of the fire alarm system). For additional requirements, see CNGV Guideline 403.

2.8.2.4 Requirements for the design and implementation of more demanding ODT systems

(1) ODT devices or systems must be designed, dimensioned and installed in such a way as to effectively remove smoke and heat in a fire. They should always be on full alert. Implementation, installation, maintenance and control are determined by the SIST EN 12101 series of standards.

(2) Devices for DPE must be designed in accordance with the guidelines or standards referred to in this point.

(3) The calculation method according to CZPV Guideline 405-1 must be used to dimension the NODT. Unless otherwise specified in this Technical Guideline, the provisions of DIN 18232-5 shall be used in the design and implementation of the MODT.

(4) If it is not possible or not reasonable to dimension devices according to CZPV Guideline 405-1 or DIN Standard 18232-5, TRVB Guideline S 125 should be used for design.

(5) In the absence of requirements in the technical documents listed above, the design and equipment shall be subject to the requirements of point 2.8.2.3.

2.8.2.5 Requirements for the design and implementation of NKD systems

(1) The smoke overpressure control system (NKD) consists of built-in, connected devices that prevent the

ingress of smoke and heat into escape and intervention routes in a fire with overpressure. The requirements for implementation are laid down in the SIST EN 12101-13 standard and for the SIST EN 12101-6 components.

2.8.3 Impact of AGS

(1) VDS guideline 2815 shall be taken into account when performing ODT control. If the ODT system is intended for evacuation safety, the ODT shall be triggered to smoke detectors or AGS, whichever is the faster.

(2) The ODT control must be adapted to the intended extinguishing system.

2.8.4 Buildings or parts of buildings where smoke and heat control is required

2.8.4.1 Buildings with protected stairways

(1) In buildings with a maximum of five above-ground floors, a smoke-free opening in the form of a window or a ventilation system, which can be opened manually, must be installed on the top floor. The opening shall have an anti-closing latch and shall be so arranged that it can be opened manually. The geometrical area of the aperture shall be 5 % of the floor area of the stairwell where this area is the largest, but not less than 1 m^2. If the opening mechanism is out of reach of the hand, a manual trigger or a manual and smoke detector on the staircase (only detectors inside the staircase) shall be provided for opening. If natural defrosting cannot be installed, mechanical ventilation shall be installed to dilute smoke with a capacity of at least 10 000 m3/h in accordance with the requirements of point 2.8.2.2.

(2) The geometric surface of a staircase is defined as the sum of stairs and landings in one floor.

(3) Doors and windows that open manually may be used to supply air on the ground floor. The geometric surface of these openings shall be at least 1,5 times the surface of the outlets. Both windows and doors for this purpose must be fitted with a guard to prevent closing.

(4) In buildings with more than five above-ground floors, smoke extraction must be provided in accordance with SZPV guideline 405-2. If it is not possible to install the NODT, mechanical ventilation with smoke dilution shall be provided in accordance with the requirements of point 2.8.2.2. with a capacity of at least 10 000 m^3/h.

(5) In protected stairways leading to more than three floors underground, a smoke dilution system — mechanical ventilation complying with the requirements of point 2.8.2.2 of a capacity of at least 10 000 m^3/h shall be installed. If the staircase is connected to above-ground floors and the building is not classified as high, separation of the above-ground and underground parts of the staircase is recommended. If separation is not possible, switches must be installed at the main entrance, with which only the ventilation of the above-ground part by natural separation or only the underground part by mechanical dilution can be activated. For sufficient mechanical dilution, the installation of a drain with a mechanical fan in the lowest basement is allowed in this case.

2.8.4.2 Commercial and service buildings (CC-SI 123)

(1) If the curtains are fixed, they shall be of non-combustible material of class A1 or A2-s1,d0, curtains of glass of classification at least E30. Automatic mobile curtains shall comply with the requirements of SIST EN 12101-1. Curtains must correspond to the temperature of the flue-gases and the operating time of the ODT system in the smoke sector.

(2) The smoke and heat extraction or control shall be designed according to Tables 26 and 27.

Table 26: Smoke and heat extraction or control without AGS

	Floor area of the room (shop, warehouse)		
No sprinkler system	up to 200 m^2	From 200 m^2 to 1000 m^2	Exceeding 1,600 m2
123 - Commercial and other buildings for service activities	No requirements	Provide floor space, windows or openings in the roof in a geometric size of 1 % of the floor area in the upper half of the outer walls or ceiling, the size of the supply surfaces must be at least the same size as the drainage surfaces, but not more than 12 m^2. The equipment must meet at least the requirements of point 2.8.2.1. If this is not possible, MODT devices shall be installed on not more than 400 m² of the floor area of the room at least	DT designed and executed in accordance with the requirements of point 2.8.2.4.

		one smoke aerator or one extraction point with a volumetric airflow of 10 000 m³/h in the upper third of the room, the size of the supply areas and the equipment shall comply with the requirements of point 2.8.2.3.	

Table 27: Smoke extraction and control with AGS

	Floor area of the room (shop, warehouse)		
AGS	up to 400 m²	from 400 m² to 1,600 m²	Exceeding 1,600 m2
123 - Commercial and other buildings for service activities	No requirements	Provide surfaces for smothering, windows or roof openings of a geometric size of 0,5 % of the floor area in the upper half of the outer walls or ceiling, the size of the supply surfaces must be at least the same size as the drainage surfaces, but not more than 6 m². The equipment must meet at least the requirements of point 2.8.2.1. If this is not possible, MODT devices must be installed on not more than 400 m² of the floor area of the room with at least one smoke aerator or one extraction point with a volumetric air flow of 5,000 m³/h in the upper third of the room, the size of the supply areas and the equipment must comply with the requirements of point 2.8.2.3.	A NODT designed in accordance with the requirements of point 2.8.2.4 or with an effective surface area of at least 0,5 % of the soil surface, the size of the supply surfaces and the equipment must comply with the requirements of point 2.8.2.3. If this is not possible, MODT devices shall be installed in accordance with the requirements of point 2.8.2.4.

(3) Notwithstanding the requirements of point 2.8.2.3, in the case of mechanical smoke and heat extraction and the implemented sprinkler system, there shall be no requirement for the temperature resistance of fans. Fans and ducts must be made of non-combustible materials.

2.8.4.3 Garage buildings (CC-SI 1242)

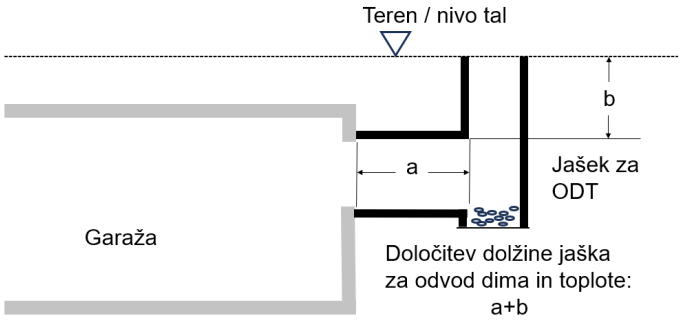
(1) The smoke and heat outlet or control shall be designed according to Table 28.

Table 28: Requirements for ODT in garages

	Floor area of the room [2]	
Type of garage building	up to 250 m² without sprinkler system	Exceeding 250 m2 without sprinkler system
	up to 500 m² with sprinkler system	over 500 m² with sprinkler system
Closed Garage Building	No requirements	The geometrical area of the outlets and inlets shall be at least 0,5 % of the area of the fire compartment [1]
Open garage building	The drainage of smoke and heat is achieved through the openings on the facades of the building. See definition of open garage building.	

[1] The individual opening shall not be less than 1 m². In the calculation, the areas of the entrance and exit from the garage can be taken into account. As inlet openings, the openings in the lower half of the height of the room are taken into account. The openings must lead directly to the open air. The length of the drain holes shall not exceed 1 m. If the shaft is longer than 1 m but not longer than 4 m, the surface of the drainage and inlet holes shall be at least 1 % of the surface of the ground. The maximum distance between two drainage outlets is 20 m and from the outlet to the furthest parking space is 15 m.

[2] See paragraph 4 of this point.



Drawing 15: Example of calculation of shaft length

(2) Closed garage buildings with natural ventilation according to Table 28 must have, in each fire sector and

for each floor, at least one air intake at ground level and at least two air intakes at, in or near the ceiling. Air inlets and smoke outlets must be on opposite sides of the garage, lead directly to the open air and be as evenly spaced as possible. Inlet ports are those that allow the installation of mobile fans (e.g. an import ramp or a door). Shafts or other openings which do not allow the installation of mobile fans shall not be permitted as inlet ports.

Example: Inadequate implementation is the implementation of air supply through fire doors.

(3) If the requirements of Table 28 cannot be met, MODT devices shall be installed. The equipment and power supply shall comply with the requirements of point 2.8.3. The requirements for MODT are:

- MODT must be dimensioned to at least 12 times the air exchange per hour, taking into account the garage's calculated height of 3 m, even if the real height is less than 3 m. Fans and ducts must ensure operation at a temperature of at least 400 °C, F_{400}. The operating time shall be the same as that required for the load carrying capacity of the fire sector from which the smoke and heat are discharged.
- Where an AGS is fitted, the MODT must be dimensioned to at least 6 times the air exchange per hour, taking into account the garage's calculated height of 3 m, even if the real height is less than 3 m. Fans and ducts must ensure at least two hours of operation at a temperature of 200 ºC, that is, at least Class F_{200} 120, and ducts must be at least E_{300} 120 (in $_{e\text{-}h\ o)}$ 500 single. However, if the channel passes through two or more fire sectors, at least Class E_{600} 120 (in $_{e\text{-}h\ o}$) shall be 500 multi.
- The system activation must be via the AJP or AGS system. If an automatic sprinkler system is installed in the garage, the MODT must switch on with an appropriate delay after the sprinkler system is triggered. The possibility of manual switching on and off shall also be provided. The manual on/off switch must be located outside the fire sector, accessible via a secured staircase and protected from misuse. It must only be used by firefighters and must be appropriately labelled.

(4) If the garage (irrespective of the size of the fire sectors) belongs to closed garages and the size of all garage spaces is greater than 500 m2, a natural or mechanical smoke and heat drain must be planned.

(5) If the garage is in another basement or lower, regardless of the size of the fire sector, a mechanical drain of smoke and heat must be carried out.

(7) For additional requirements, see SZPV Guideline 311.

2.8.4.4 Industrial buildings and warehouses (CC-SI 125)

(1) The smoke and heat outlet or control shall be designed according to Table 29. For the RS, see point 2.8.4.6.

Table 29: Smoke and heat extraction or control for industrial buildings and warehouses without sprinkler system

	Floor area of the room			
Fire load	up to 200 m^2	From 200 m^2 to 600 m^2	from 600 m^2 to 1,200 m^2	Exceeding 1,200 m2
< 250 MJ/m^2	No requirements	No requirements	No requirements	No requirements
250 to 1,000 MJ/m2	No requirements	No requirements	Provide semi-detachment surfaces, windows or openings in the upper half of the outer walls or roof in a geometric size of at least 2 % of the floor area, the size of the supply surfaces and the equipment must meet at least the requirements of point 2.8.2.1. If this is not possible, MODT devices with 8x interchange shall be installed and the size of the supply surfaces and	DT designed and executed in accordance with the requirements of point 2.8.2.4.

			equipment shall comply with the requirements of point 2.8.2.3.	
above 1,000 MJ/m2	No requirements	Provide semi-detachment surfaces, windows or openings in the upper half of the outer walls or roof in a geometric size of at least 2 % of the floor area, the size of the supply surfaces and the equipment must meet at least the requirements of point 2.8.2.1. If this is not possible, MODT devices with 8x interchange shall be installed and the size of the supply surfaces and equipment shall comply with the requirements of point 2.8.2.3.	DT designed and executed in accordance with the requirements of point 2.8.2.4.	DT designed and executed in accordance with the requirements of point 2.8.2.4.

Table 29: Smoke and heat extraction or control for industrial buildings and sprinkler storage

	Floor area of the room			
Fire load	up to 400 m^2	from 400 m^2 to 1,200 m^2	from 1.200 m^2 to 2.400 m^2	Exceeding 2,400 m2
< 250 MJ/m2	No requirements	No requirements	No requirements	No requirements
250 to 1,000 MJ/m2	No requirements	No requirements	Provide semi-detachment surfaces, windows or openings in the upper half of the outer walls or roof in a geometric size of at least 0,5 % of the floor area, the size of the supply surfaces and the equipment must meet at least the requirements of point 2.8.2.1. If this is not possible, MODT devices with 2x interchange shall be installed, and the size of the supply surfaces and equipment shall comply with the requirements of point 2.8.2.3.	DT designed and executed in accordance with the requirements of point 2.8.2.3 or 2.8.2.4
above 1,000 MJ/m2	No requirements	Provide semi-detachment surfaces, windows or openings in the upper half of the outer walls or roof in a geometric size of at least 0,5 % of the floor area, the size of the supply surfaces and the equipment must meet at least the requirements of point 2.8.2.1. If this is not possible, MODT devices with 2x interchange shall be installed and the size of the supply surfaces and equipment shall comply with the requirements of point 2.8.2.3.	DT designed and executed in accordance with the requirements of point 2.8.2.3 or 2.8.2.4	DT designed and executed in accordance with the requirements of point 2.8.2.4.

(2) If an automatic extinguishing system is implemented in terms of complete protection of the building, there are no requirements for the temperature resistance of fans and ducts. Fans and ducts must be made of non-combustible materials.

2.8.4.5 High-rack warehouses

(1) In high bay depots with a fire load greater than 250 MJ/m ^{2}, ODT devices initiated by AGS or AJP in the event of fire shall be installed. The control implementation shall follow VdS 2815. Manual activation/off/automatic operation of ODT from a safe location shall also be provided.

(2) The required effective surface area for NODT without calculation shall be at least 0,5 % of the surface area of the fire compartment of the high bay part of the storage depot with an installed sprinkler system or 2 % in the absence of a sprinkler system. Ground-mounted doors and windows with a surface area of at least 1 times the geometric drainage area may be used for air supply. Inlet openings can be opened manually.

(3) In the case of a sprinkler system, the thermal ignition temperature of the NODT aerators (if ignition is provided via thermal ampoules) shall be at least 30 °C above the temperature of the sprinkler nozzles.

2.8.4.6 Health care buildings, prisons, correctional centres (CC-SI 1264, 113, 12740, etc.)

(1) In buildings occupied by people in need of care or assistance from others (e.g. hospitals, sheltered housing, nursing homes) and in buildings where people have limited mobility (e.g. prisons, correctional homes), smoke extraction must be provided in protected staircases in accordance with SZPV 405-2 if the building has up to and including four above-ground floors. Smoke dilution with ventilation systems in accordance with point 2.8.2.2., with a capacity of at least 10 000 m ^{3}/h, must be ensured at more than four above-ground levels.

2.8.4.7 Spaces for many users

(1) The smoke and heat outlet or control shall be designed according to Table 30.

Table 30: Smoke extraction and control in rooms for many users

	Floor area of the room		
	< 200 m ^{2}	from 200 m ^{2} to 1,200 m ^{2}	> 1,200 m ^{2}
Requirements	No requirements	Provide semi-detachment surfaces, windows or openings in the upper half of the outer walls or roof in a geometric size of at least 2 % of the floor area, the size of the supply surfaces of the equipment must meet at least the requirements of point 2.8.2.1. If this cannot be ensured, a mechanical smoke extraction system with a capacity of 36 m ^{3}/h per square metre of floor area must be installed, and the size of the supply areas and equipment must meet at least the requirements of point 2.8.2.3.	ODT shall be dimensioned according to point 2.8.2.4, ODT shall ensure that the rooms do not smoke more than 2,5 m high.

N.B.: The implementation of the AGS does not reduce the requirements for ODT of such premises.

(2) In protected stairways in the interior of buildings with more than two floors and stairways with a width of more than 2.4 m, it is necessary to install respiration in accordance with CZPV guideline 405-2 or to install a mechanical smoke dilution system ventilation in accordance with the requirements of point 2.8.2.2. of a capacity of at least 10,000 m ^{3}/h.

2.9 AUTOMATIC FIRE EXTINGUISHING SYSTEM

(1) The automatic sprinkler system must be designed and implemented in accordance with the SIST EN 12845 standard. Equipment and devices must comply with the parts of the SIST EN 12259 standards relating to them.

(2) Notwithstanding the preceding paragraph, an automatic sprinkler system may be designed and implemented in accordance with the requirements of CEA 4001, VDS CEA 4001 or NFPA 13 or FM global, DS 2-0.

(3) Water fog systems according to VDS 3188 or NFPA 750 or FM global, DS 4-2 may be installed instead of sprinkler systems if installation is permitted according to these guidelines. The system supplier must demonstrate the suitability and appropriateness of the system by means of tests carried out by an independent institution.

(4) The fire alarm system shall monitor:

- Activation of AGS for each alarm valve separately,
- error reporting for all control and control elements such as pressure, control valves, signal valves, etc.

  The alarm and system failure shall be reported to a 24/7 duty station.

(5) Entry into the engine room of the fire-fighting system must be:
- directly from the outside, or
- from a sheltered corridor with access to the open air, or
- from a protected staircase with access to the open air.

(6) A protected staircase and a protected corridor through which access to the machinery space can also be used for evacuation purposes.

(7) The machinery space must be a separate fire sector with the same fire resistance as required for the load-bearing structure of the building or as required for the operation time of the fire-fighting system.

(8) The entrance to the machinery space must be clearly marked and provided for in a place not threatened by a possible fire in the building. The connections for filling the sprinkler system must be marked in accordance with CNGV guideline 206.

2.10 SAFETY APPLICATIONS AND REQUIREMENTS FOR SAFETY SYSTEM GUIDELINES

2.10.1 Safety power supply

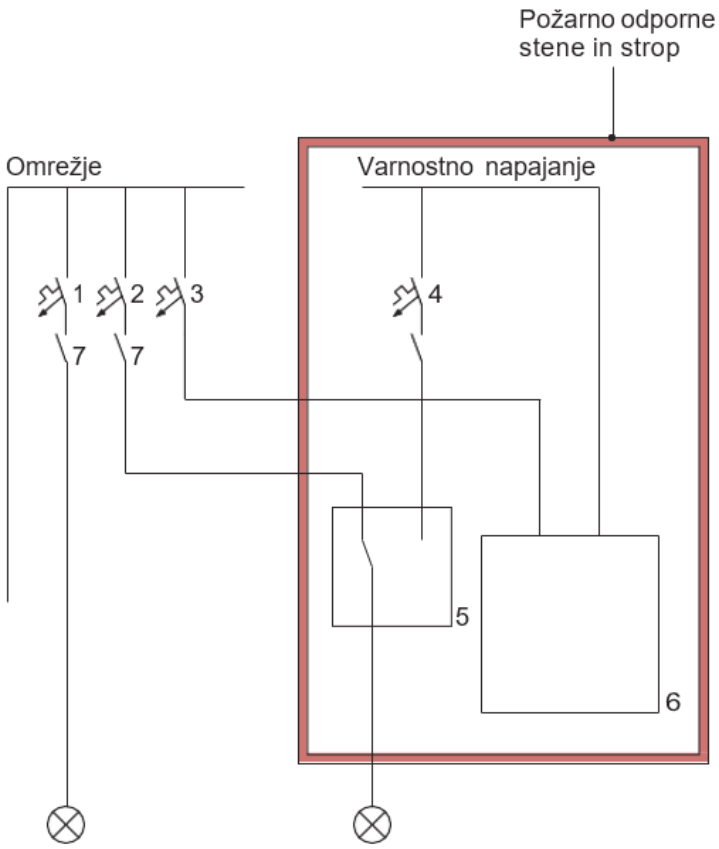
(1) Unless otherwise specified in this Guideline, all active fire protection systems and other systems required to function in the event of fire shall have a safety supply.

(2) A backup power supply is a system that operates independently of the mains power supply. These may be batteries, central power supplies, generators, etc. In some cases, the simple safety power modes described in 2.10.3. are also allowed.

(3) Sources of backup power (e.g. battery, generator) must be installed in fire-separated spaces. The fire separation for walls and doors shall be at least the same as required for the load-bearing structure of the building, but at least EI 30. The sources of the safety supply shall be fire-separated from the spaces where the high voltage distribution electrical cabinets are located. Appliances which have their own source of power inside the enclosure, such as a fire switch, a smoke and heat extraction control system, must be installed in a fire-separated electrical compartment or, in the case of small appliances, may also be located in protected parts of the escape routes. Smoke and heat extraction or control systems may be located in the space for which they are intended, provided that there are no requirements for the implementation of fire-resistant cables.

(4) Batteries must be designed in accordance with the SIST EN 50272 series of standards. Batteries that are not performed as maintenance-free batteries must be installed in a ventilated room. Ventilation requirements should be laid down in accordance with that series of standards.

(5) The safety supply cabinets shall be fire separated from the general supply cabinets of Class EI 60 minimum (see drawing 16) or separated from the general supply cabinets by a minimum distance of 0,8 m. The cabinets shall be of non-combustible material.



Drawing 16: Example of the implementation of a fire-separated room

(6) Premises with a safety supply shall be located in an easily accessible place. Suitable places are electrical spaces or special spaces for back-up power supply. Access must be either directly from the outside or via a protected staircase or via a protected corridor connected to a protected staircase, directly from the outside.

(7) In buildings listed in CNGV 403, a fire switch must be installed. This key switches off the power supply to the building's consumers and makes firefighting intervention safer.

Example: The fire switch is intended to switch off non-fire consumers and is very important for buildings where an easy-to-use safety power supply mode is installed or where other consumers are also installed on a backup power supply (aggregate). In this case, the fire extinguisher switches off the mains voltage to all consumers except consumers such as smoke and heat extraction.

(8) The implementation of the backup power supply shall comply with SIST HD 60364 – 5 – 56.

2.10.2 Powering of ODT devices

The power supply for ODT devices must comply with the standard SIST EN 12101-10.

2.10.3 Easy mode of backup power supply

(1) Notwithstanding points 2.10.1 and 2.10.2, for some buildings a simple backup mode as set out in Table 31 is permitted.

Table 31: Easy way to power up

Classification of the entire building (CC-SI)[1]	BTP of the building or number of persons in the whole building	
	Maximum BTP buildings (m2)	Maximum number of people in the building
112 - multi-apartment buildings (except CC SI 1121) 113 - Residential buildings for specific social groups 122 - Commercial and administrative buildings 1242 - Garage buildings 125 - Industrial buildings and warehouses up to 1000 MJ/m2 1271 - Non-residential agricultural buildings 1272 - ceremonial buildings 1274 - Other buildings n.e.c.	not limited	200
121 - Catering buildings 123 - Merchant and service buildings below 1000 MJ/m2 1241 - Station buildings, terminals, communication buildings and associated buildings 125 - Industrial buildings and warehouses above 1000 MJ/m2 1261 - Culture and entertainment buildings 1262 - Museums and libraries 1263 - Education and scientific research buildings 1265 - Sports buildings	2.000	500
123 - Merchant and service buildings above 1000 MJ/m2 1264 - Health care buildings High-rise buildings	not allowed	not allowed

[1] A building is considered to be an entire building that has common evacuation routes and is structurally connected. Only buildings which have completely separate escape routes and are structurally separated and fire separated for a minimum of 60 minutes may be considered as separate buildings.

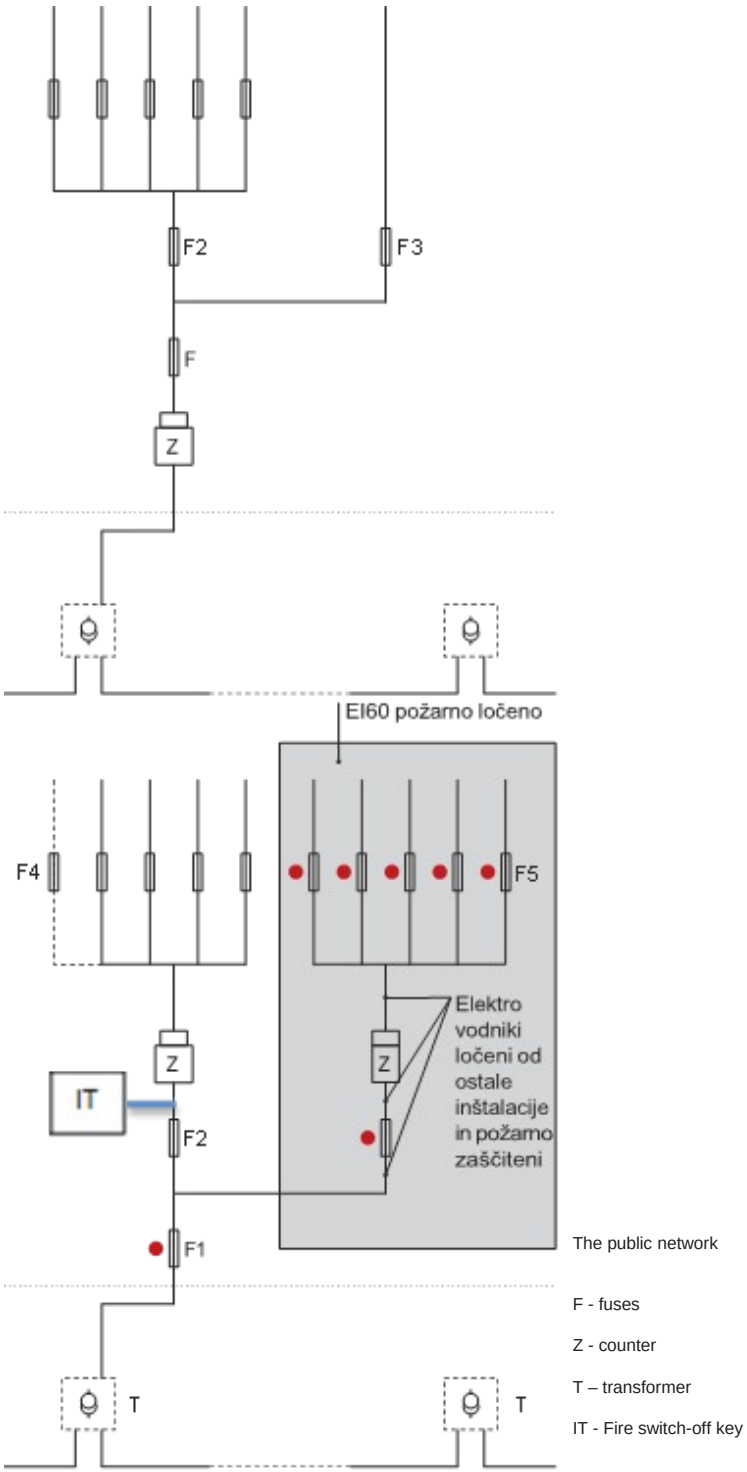
Example: BTP of a building can be determined in a similar way as according to the Rules on the preparation of fire risk assessments.

(2) By following Table 31, a simple backup mode is permitted for the following systems:

- the removal of smoke and heat from the garages,
- sedentary according to 2.8.2.1 or 2.8.2.3,
- smoke dilution by ventilation systems according to point 2.8.2.2,
- pumps for raising the pressure of the internal hydrant network,
- CNG 410 level B lifts.

(3) The main switch of the building should not turn off the consumers of the simple mode of safety power supply. The main power supply switch must be clearly marked with the inscription "SECURITY BUILDING", the cabinet must be red in color. The users of the back-up power supply shall be connected to separate circuits which shall be clearly marked. Please also take into account the requirements of SZPV 403.

(4) An example of a simple safety power supply is shown in drawing 17. Execution is also possible with a common counter.



Drawing 17: Easy way to secure power through the public network

2.10.4 Requirements for safety system conductors

(1) The requirements for the installation of power lines and the time requirement to maintain operation are given in CNGV Guideline 408.

(2) Safety power supply guides with a conservation function in the event of fire must be guided along separate routes. If they are guided superficially and without fire lining, the conservation function must be ensured by means of load-bearing and fixing elements and an appropriate method of laying, as declared by the manufacturer on the basis of the tests carried out by an accredited body.

2.11 SPECIAL REQUIREMENTS FOR SPECIAL TYPES OF BUILDINGS[4]

2.11.1 Multi-apartment buildings (CC-SI 112) and residential buildings with sheltered housing (CC-SI 11301)

(1) Each apartment is a separate fire sector with boundary elements (walls and ceilings) having a fire resistance of at least (R)EI 60. Doors to dwellings shall have a fire resistance of at least EI_1 30-Cx in the case of combustible lining of walls or ceilings (Class B, C or D) in the protected part or EI_2 30-Cx in the case of non-combustible lining of walls and ceilings (Class A1 or A2-s1,d0) in the protected part. Doors to apartments can be without a self-closing, if they do not open directly to the staircase (lead to a protected corridor that is fire-separated from the staircase).

(2) For buildings with serviced housing (CCSI11301), additional requirements must be considered:

- Between floors, a parapet must be carried out in accordance with the requirements of point 2.4.3.1, second, third and fourth paragraphs,
- No allowance is allowed in point 3.6.1, first paragraph,
- Regardless of the size, the garage must be fire-separated from the staircase with an entrance hall,
- The corridor connecting the staircase to the exit to the open air shall have penetrations and openings closed by fire-resistant and smoke-resistant doors of the same fire resistance as required for the supporting structure of the building, e.g. $EI_2$60-Cx, S_{200}
- The elevator must be on all floors within the fire sector of the staircase
- Regardless of the size of the building, the facade must be in a non-combustible version of A1 or A2-s1,d0
- An automatic fire alarm system must be installed in the common areas of the building in accordance with point 3.5.

2.11.2 Hotel and similar buildings for short-term accommodation (CC-SI 12111), other catering buildings for short-term accommodation (CC-SI 1212) and non-residential buildings not elsewhere classified (CC-SI 1274)

(1) Each accommodation unit shall be a separate fire sector with border elements (walls and ceilings) with a fire resistance of at least (R)EI 30.
(2) The hotel room entrance door shall have a fire resistance of at least EI_1 30-C3 in the case of combustible lining of walls or ceilings (Class B, C or D) or EI_2 30-C3 in the case of non-combustible linings (Class A1 or A2-s1,d0) in the protected part.

2.11.3 Commercial and other buildings for service activities (CC-SI 123)

(1) There is no need to separate the storage part, the preparation as well as the office for the needs of the store from the fire part.
(2) Notwithstanding the first paragraph, in commercial buildings without a sprinkler system, storage depots must be fire-separated if they are larger than 500 m^2.
(3) In commercial buildings, premises with a high fire risk (e.g. workshops, warehouses for highly flammable or explosive substances) must be fire-separated.
(4) If the commercial premises are located in a second or lower basement, they must be fire-separated on the floors.
(5) If the commercial premises are on basement floors, the fire resistance of the structure must be at least R 60 and the fire separation must be at least EI 60 (non-combustible materials of class A1 or A2-s1,d0).

2.11.4 Garage buildings (CC-SI 1242)

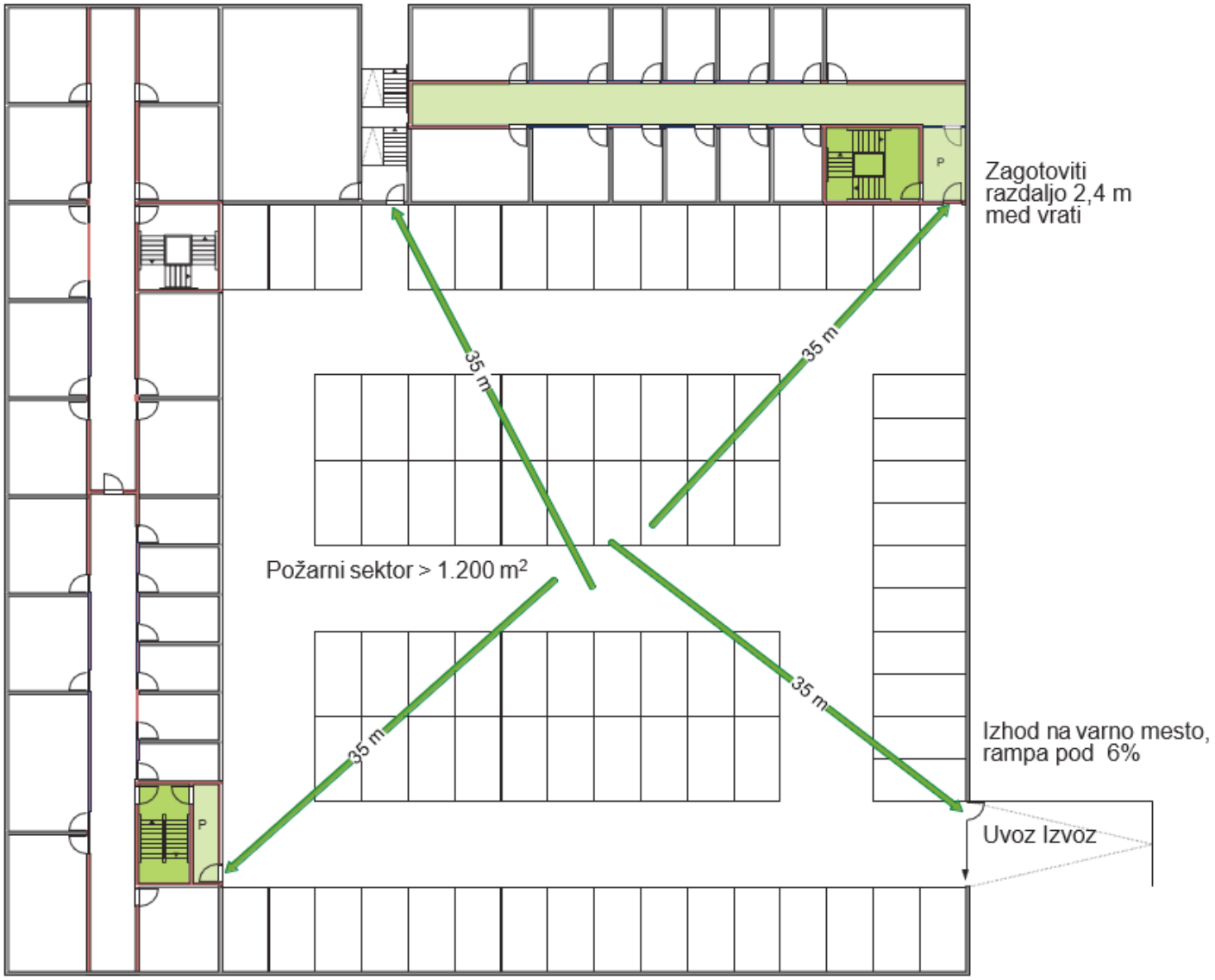
(1) If separation of the garage in several fire sectors is required, the fire resistance of the partition walls shall be at least the same as required for the load-bearing structure (e.g. R 90 fire resistance is required for the

[4] See point 2.8.4 for the specific requirements for LMOs for specific types of buildings.

structure, EI 90 fire resistance is required for the walls). Aperture closures (e.g. ramps) at the border between fire sectors shall have a fire resistance of at least EI 30-Cx. If there are no parking spaces or other combustible materials on at least one side at a distance of at least 3 m, the fire resistance of the barrier elements of the openings shall be at least E 30-Cx.

(2) In enclosed garages with fire sectors larger than 1,200 m ^{2}, vestibules must be located in front of protected stairways (see Figure 18). The fire resistance of the vestibules shall be the same as that of the load-bearing structure, but not less than EI 30. Doors to vestibules must have fire resistance EI $_2$ 30-Cx, doors from vestibules to staircases must have a minimum E 30-Cx, the distance between doors must be at least 2.4 m. The requirement for the execution of the vestibule need not be taken into account if the staircase leads from only one floor directly to the open (the staircase no longer connects the floors).

(3) Elevators intended exclusively for the garage can be opened into the garage. In the case of fire-separated garage floors, fire separation must also be provided on the shaft doors. If the lift is connected to other purposes (e.g. offices, shops), the entrance hall shall be provided in accordance with the requirements of TSG 1-001, point 2.11.4 (2) before entering the lift, in which case there shall be no requirement for the distance between the fire-resistant swing doors and the manhole doors of the lift.



Drawing 18: Demonstration of the entrance halls at the passage from the garage to the protected staircases

(4) In addition to the requirements of this technical guideline, the complementary requirements of CNGG 311 should also be taken into account.

Healthcare buildings (CC-SI 1264) and residential buildings for other specific social groups (CC-SI 11302)

(1) Depending on the possibility of evacuation, two types of buildings are distinguished:

a) buildings containing persons dependent on foreign assistance (patients, operating rooms, emergency rooms, etc.),

b) buildings containing persons who can be evacuated independently (outpatient activities, dentistry, prevention, student dormitories, boarding schools, orphanages, monasteries, refugee centres, asylum centres).

(2) In parts of buildings where there are more than five persons dependent on foreign aid, the following must be ensured:

1. the maximum size of the fire compartment may be 400 m^2 or a maximum of 10 lying persons within the fire compartment;
2. the operating blocks must be implemented as a separate fire sector with at least the same fire resistance as required for the load-bearing structure;
3. warehouses and technical facilities must be constructed as separate fire sectors;
4. fire dampers shall be controlled by smoke detectors, fire dampers shall not be permitted by thermal control only.

(3) The service door shall not open to the staircase. Doors to a service room may be without a self-closing device provided that they do not open directly into a room with a fire load greater than 250 MJ/m^2. The requirements of point 2.11.1 must also be taken into account if the caretakers' premises are constructed as residential units.

(4) The first and second paragraphs of this point need not be taken into account in the parts of the building where there are persons who can be evacuated independently without foreign assistance.

(5) If an automatic fire-extinguishing system is installed in the building in accordance with point 2.9, the maximum size of the fire sector may be increased to 1,200 m2 and the maximum number of persons within one sector may be increased to a maximum of 30 persons lying down. Horizontal evacuation requirements remain unchanged.

2.11.6 High-rack warehouses

(1) The REI 90 fire resistant wall is required between the VRS and other premises, such as workshops, technical rooms, office work (not applicable to single storage office work up to 50 m^2). Passage through this wall must be protected by at least EI 90. The loading ramp may be located in the warehouse sector, except in the case of automatic high-rack warehouses.

(2) In warehouses where the upper edge of the stored material is higher than 9 m, AGS must be installed.

(3) In warehouses where substances may not be extinguished by water and where automatic sprinkler extinguishing is required, another equivalent extinguishing system or a system to prevent the spread of fire (e.g. reduction of oxygen concentration) must be installed.

(4) In warehouses where the bulk of flammable liquids are stored and where automatic sprinkler fire-extinguishing is required, an equivalent fire-extinguishing system or CO_2 gas-extinguishing system may be installed.

(5) If the stored materials are environmentally harmful or form environmentally harmful substances when burnt, firewater recovery measures must be provided in accordance with point 4.2.3.4 of this Technical Guideline.

(6) In addition to the requirements of this technical guideline, the complementary requirements of SZPV 210 should also be taken into account.

(7) For automatic high-rack warehouses with a storage height above 9 m, the requirements of VDI 3564

must be complied with.

2.11.7 Atrium buildings

(1) If an atrial building exceeds at least one of the following conditions:

- the height of the atrium is above 11 m; or
- The atrium extends over more than three floors
- the total area of all floors in the fire sector exceeds 3 600 m^2,

the additional requirements of CNGV 209, including smoke and heat extraction requirements, shall be taken into account.

(2) If the atrium connects two floors and the floors are connected into one fire sector, there are no additional requirements. Maximum permissible lengths of escape routes must be observed.

(3) In the case of three fire compartment-related floors, additional requirements must be taken into account:

- If there is also a staircase inside the atrium and it is considered as an evacuation route when determining the evacuation routes, the atrium must be executed as a protected staircase. If the staircase is not intended for evacuation, the atrium does not need to be fire-separated for this reason.
- If a fire-separate protected staircase is evacuated through an atrium on the same floor, a smoke and heat drain shall be provided in accordance with point 2.8.2.4 of this Technical Guideline.
- If evacuation routes take place outside the atrium into protected stairways, an effective area NODT of 0,5 % of the atrium floor area and of the maximum atrium-related space or at least 2,5 % of the atrium floor area shall be provided, the equipment shall comply with point 2.8.2.3 of this Technical Guideline.
- The AJP system must be implemented in the attio in accordance with point 3.5. The smoke and heat outlet must be controlled by a fire alarm system. Ground openings, entrance doors as well as openings from other spaces leading to the atrium may be used for air supply, provided that sufficient air can be supplied through them. The size of the supply areas must be at least equal to the size of the drainage areas.

(3) In the case of three floors and each floor has its own fire sector, additional requirements must be observed:

- The atrium must be carried out as a separate fire sector.
- If there is also a staircase inside the atrium and it is considered as a protected staircase when determining the escape routes, the atrium must be carried out taking into account fire separations, materials and swept away, as in the case of protected staircases.

(4) In the case of open indoor courtyards (atrium without a roof) in the case of two or three floors, additional requirements must be observed:

- Regardless of fire separations, the entire facade must be in class A1 or A2-s1,d0,
- In the case of fire-separated floors, measures must be provided for in accordance with point 2.4.3.1.

2.11.8 Buildings of general social interest - spaces for many users

(1) Spaces in buildings of general social interest, such as workshops, warehouses, areas with a high fire risk, must be fire-separated from the rest of the premises.

(2) Notwithstanding the requirements of the preceding paragraph, translators' booths and local equipment depots up to a size of 100 m^2need not be fire-separated from premises for many users.

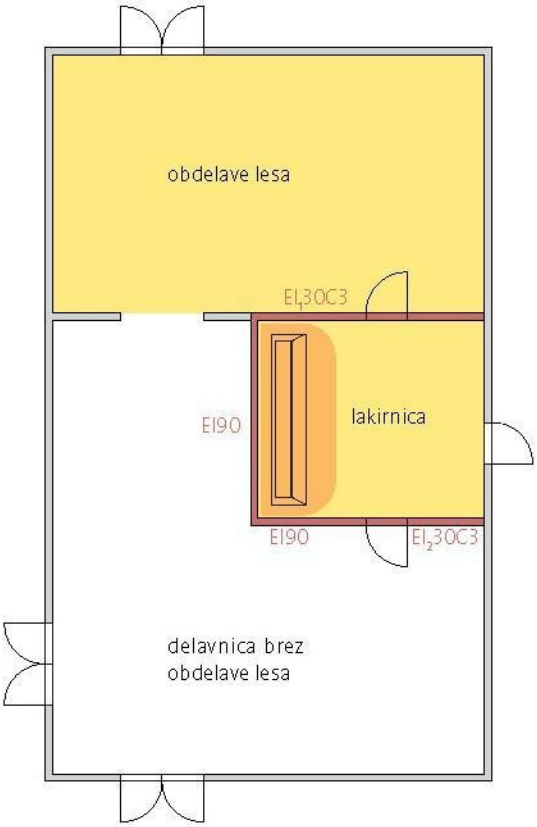
(3) The floor of the scaffolding must be carried out tightly without joints (e.g. no classification requirements S_{a3} or S_{200}), working apertures are allowed. The substructure of the scaffolding must be made of non-combustible material. Scaffolds up to 20 m^2can have a wooden substructure.

(4) The substructure of the moving tribunes must be of non-combustible material, the floors must be of hard-combustible material (class B or C).
(5) The openings in the roof intended to illuminate the room must be of non-combustible materials, in the case of automatic extinguishing, they may be made of a material of at least C-s2, d0, which is difficult to combust.
(6) Isolation of partitions or e.g. acoustic linings shall, notwithstanding the other points of this Guideline, be of non-combustible material of Class A1 or A2-s1,d0.
(7) If evacuation from the space for a large number of persons is carried out through the entrance hall (vestibule), the linings on the walls and ceilings of the entrance hall must be made of non-combustible materials and the floor covering must be at least B_{fl}-s1.
(8) The substructure of the lining should be made of non-combustible materials. Combustible substructure is allowed for rooms up to 100 m^2. If normally combustible materials (class D or E) are allowed on walls or ceilings, electric conductors must be guided away to combustible materials in non-combustible ducts.
(9) Electrical spaces must be inaccessible to visitors (e.g. locked or accessible only from premises occupied by employees).
(10) Galleries for lights and sound systems must be made of non-combustible materials.
(11) Buildings with rooms for a large number of users, which have rooms for more than 200 people on the second or lower floors of the basement, must have an AGS.
(12) Open kitchens in rooms for a large number of users larger than 30 m^2 must have an automatic local extinguishing system in accordance with the standard SIST EN 16282-7 or VdS 2807.
(13) Workshops, warehouses and areas with high fire risk must not be directly connected to a protected staircase (they may be connected to a corridor or entrance hall).

2.11.9 Lacquers

(1) The lacquer must be carried out along the outer wall of the building. In order to prevent the impact of fire on higher-lying floors or adjacent spaces, additional measures must be taken, such as:
- The lacquer must have external windows or doors
- Parapet between floors must be carried out in accordance with the requirements of point 2.4.3.1, first paragraph
- The facade must be made of non-combustible materials A1 or A2-s1,d0
- The door of the paint shop must not lead directly to the staircase or to the exit from the staircase, passage through the protected corridor is allowed

(2) The wall against the rest of the rooms must be of the REI 90 class. The floor, walls and ceiling shall be of non-combustible material of class A1 or A2-s1,d0. Doors in these walls shall have a fire resistance of at least EI_2 30-Cx (see drawing 19).



	Fire Dangerous Area
	Explosion risk area
	Fire resistant wall

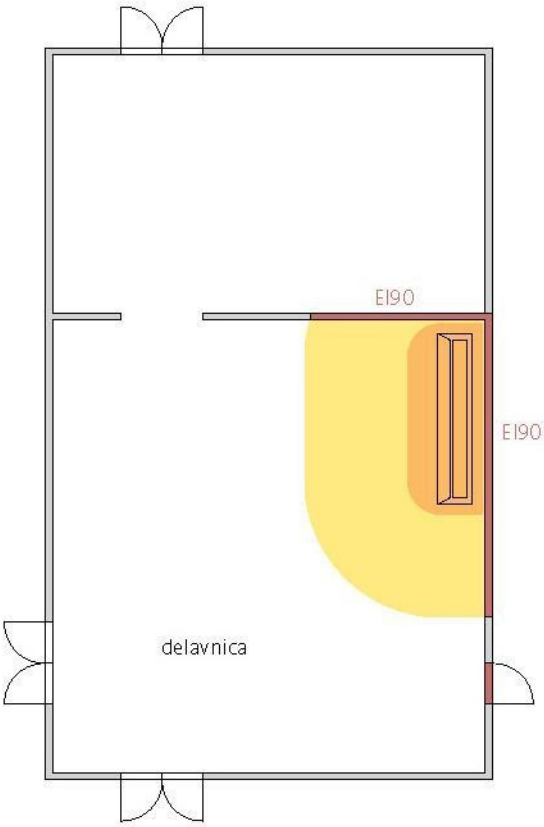
Drawing 19: Example of a paint shop in the wood industry

(3) Installation of industrially manufactured paint and drying chambers compliant with SIST EN 16985 is permitted.

Such paint and drying chambers may be placed inside the room, a safety zone must be arranged within a distance of up to 5 m (figure 19 shows the fire danger zone) in which there must be no sources of ignition and no combustible materials, objects or devices. The distance may be reduced if a wall of Class EI 90 is in the direction of reducing the safety zone. An example of the execution is shown in drawing 20. The space where the paint and drying chambers are placed must comply with the requirements of DGUV 209 – 046.

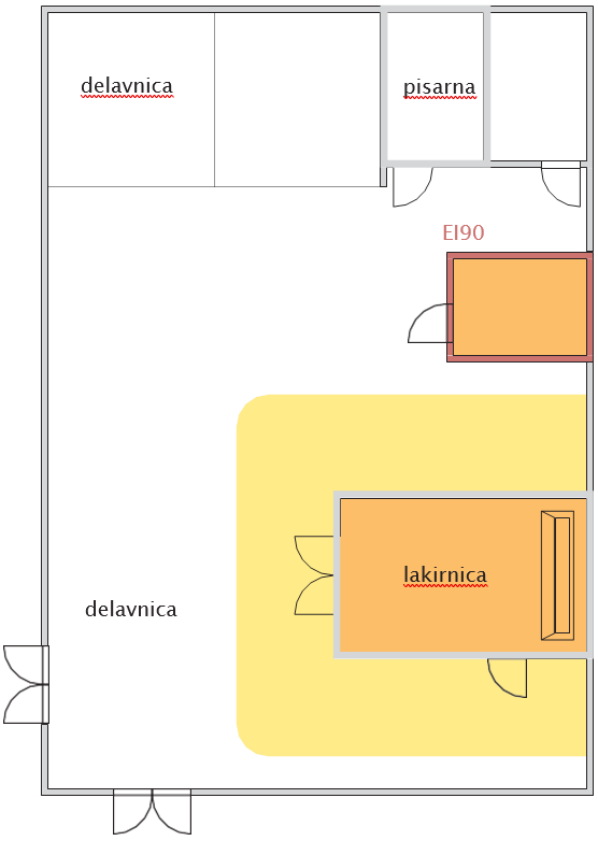
(4) The storage and mixing plant of flammable liquids must be carried out as fire sector of class EI 90 and doors of class EI_2 90-Cx.

(5) The lacquer drying chamber can be inside the workshop. In the vicinity of the wall there should be a fire danger zone of 5 meters, where combustible materials are not installed. An example of the execution is shown in drawing 21.



	Fire Dangerous Area
	Explosion risk area
	Fire resistant wall

Drawing 20: Example of the implementation of a painting room inside the workshop



(6) There shall be no openings to other spaces in the fire danger zone. The floor, wall and ceiling should be made of non-combustible materials. The walls towards adjacent spaces must be of class EI 90.

(7) When varnishing with substances that do not form explosive mixtures with air, there are no requirements for the implementation of fire-resistant walls.

(8) In addition to the requirements of this technical guideline, the supplementary requirements of DGUV 209 – 046 should also be taken into account.

	Fire Dangerous Area
	Explosion risk area
	Fire resistant wall

Drawing 21: Example of a paint-drying chamber or paint shop without walls with fire resistance and warehouse in a workshop

2.11.10 Warehouses of explosives or pyrotechnic articles

In addition to the requirements of this technical guideline, account should be taken of the Regulation on specific requirements for facilities containing explosives or pyrotechnic articles.

2.11.11 Premises containing dangerous substances

(1) The measures are determined according to the type and quantity of hazardous substances and the method of storage When storing chemicals of different classes, the rules of joint storage according to the Rules on technical and organizational measures for the storage of hazardous chemicals must be observed.

(2) Table 32 sets out the maximum permitted quantities of hazardous substances for less fire-retardant buildings that may be stored in the fire sector or in fire-retardant cabinets for dangerous substances in packaging in accordance with the standard SIST EN 14470-1 and in accordance with the standard SIST EN 14470-2 for dangerous substances in pressurised containers. The fireproof cabinet for dangerous substances, stored in the original sealed packaging, does not need ventilation. Refractory cabinet for hazardous chemicals stored after re-sealed packaging needs minimal ventilation after use.

Table 32: Maximum quantities of substances that may be stored in rooms constructed as separate fire sectors or fireproof cabinets in less fire-prone buildings

Class of chemicals according to GHS (Globally Harmonised System) classification[1]	No AJP or stable device	AJP	AGS or equivalent extinguishing system or oxygen reduction system in the enclosure.
Flammable liquids of categories 1, 2 or 3[2] (H224, H225, H226)	10 kg (H224) 20 kg (H225) 100 kg (H226)	200 kg (H224 / H225) 1000 kg (H226)	

Flammable solids Category 1 or 2 (H228) Self-heating substances and mixtures of category 1 or 2 (H251, H252)	20 kg	200 kg	
Flammable gases of category 1A, 1B or 2 (H220, H221) Oxidising gases category 1 (H270) Pressurised gases, non-acute toxic category 1, 2 or 3, non-flammable and non-oxidising (H280, H281)	50 kg or 1 pressure vessel	200 kg or 400 l	
Flammable liquids not classified and having a flashpoint temperature of less than 60 °C Flammable solids not classified	100 kg	400 kg	
Aerosols of category 1, 2 or 3 (H222, H223, H229)	20 kg or 50 pcs	200 kg or 500 pcs	
Oxidising liquids Category 1 or oxidising solids Category 1 (H271)	1 kg	5 kg	
Oxidising liquids of category 2 or 3 or oxidising solids of categories 2 and 3 (H272) Acutely toxic liquids and solids Category 1, 2 or 3 (H300, H301, H310, H3011, H330, H331) Mutagens, carcinogens and reproductive toxicants, cat. 1A, 1B (H340, H350, H350i, H360, H360F, H360D, H360FD) Hazardous substances toxic to target organs (single and repeated exposure) Category 1 (H370, H372)	50 kg	200 kg	
Category 1 pyrophoric liquids or Category 1 pyrophoric solids (H250) Self-reactive hazardous substances of type C & D, E & F (H242)	100 kg	200 kg	
Substances or mixtures which, in contact with water, emit flammable gases of categories 1, 2 or 3 (H260, H 261)	20 kg	200 kg	It is not allowed to pour water
Acute toxic gases category 1, 2 or 3 (H330, H3311 in combination with H280 OR H281)	0.5 kg or 1 l	200 kg or 400 l	
Other substances/mixtures classified as hazardous (not specified above except explosives)	1000 kg	1000 kg	

[1] The alphanumeric character, consisting of the letter H and a three-digit number, is an abbreviation for the properties of chemicals that are written in the GHS Regulation (REGULATION (EC) No 1272/2008)

[2] Categories 1, 2 and 3 are laid down in the GHS Regulation (REGULATION (EC) No 1272/2008) and are highly flammable substances, highly flammable substances and flammable substances.

(3) In the case of mixed storage, the maximum quantity of dangerous substances in the fire sector or in fireproof cabinets for dangerous substances shall not exceed 1,500 kg.

(4) In addition to the requirements of this technical guideline, for fire-retardant buildings, the requirements ~~of document a~~ CNGV 210 must also be taken into account, provided that these requirements do not conflict with the Rules on technical and organisational measures for the storage of dangerous chemicals.

2.11.12 Premises with high fire risk

Spaces with a high fire risk (hot works workshops, product test rooms, etc. …) should be implemented as a separate fire sector with the same fire resistance as required for the supporting structure of the building.

2.11.13 Laboratories

(1) Laboratories also have different fire protection requirements depending on the hazards. Laboratories posing a higher risk to humans or the environment have higher requirements for fire separation and other fire protection measures. An example of the implementation of laboratories is shown in drawing 22.

(2) There are several types of laboratories:

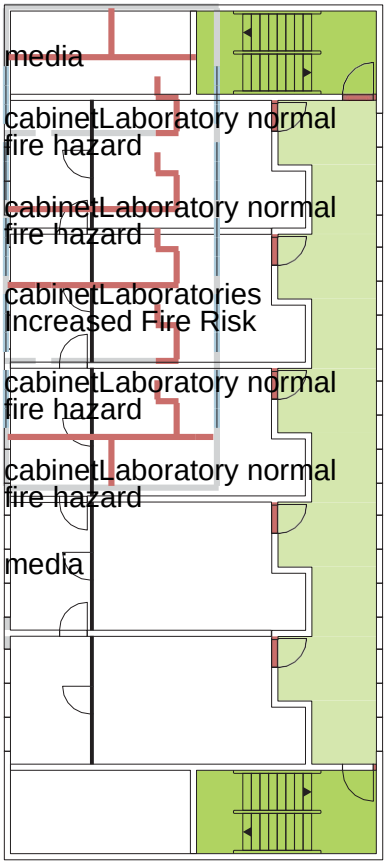
-physically chemical,

-radiological,

-genetic-biological,

-laboratories with light radiations.

N.B.: Laboratories which present an increased fire risk and which, as a result of fire, may cause a danger to persons or the environment, must be carried out as separate fire sectors. Hazardous substances must be stored in fireproof cabinets or in separate fire compartments. Fire-retardant cabinets must not be placed on escape routes (e.g. common corridors). Installations for the distribution of gas or gas cylinders shall not be installed on protected parts of the evacuation routes. A central gas station must also ensure the manual closing of the flow of fire-hazardous gases.



Drawing 22: Example of Laboratories

(4) Digesters must meet the requirements of the SIST EN 14175 series of standards.

2.11.14 Waste collection and treatment buildings

Buildings for the collection and treatment of waste shall be designed in accordance with CFPA Guideline E No 32.

2.11.15 Archives, archive warehouses and archive rooms inside buildings - storage rooms

Premises for these purposes must be fire-separated from other spaces with fire-resistant walls and doors with fire-resistance as required for the structural support of the building.

2.11.16 Rubber storage buildings

(1) This point of the guideline does not apply to the storage of end-of-life tyres.

(2) The requirements for the premises where the tyres are stored are:

- the room should be next to the outer wall of the building,
- the space must have at least one opening directly into the open air of 2 m x 2 m,
- a space of up to 60 tonnes or up to an area of 600 m^2 must be carried out as an independent fire sector with walls of at least EI 60 and smoke and heat extraction in accordance with point 2.8 of this technical guideline,
- a space of more than 60 tonnes and an area of more than 600 m^2 must be fire-separated by walls EI 90 and smoke and heat extraction in accordance with point 2.8 of this technical guideline, an automatic foam-extinguishing system must be installed in such a large space,
- the maximum size of the fire sector must not exceed 2 400 m^2, and the maximum quantity of tyres stored in each fire sector must not exceed 240 tonnes.

2.11.17 Refrigeration rooms

(1) If a combustible refrigerant is used, the technical space for refrigeration devices shall be fire separated from the refrigeration room. Other technical spaces (e.g. electrical space) must also be fire-separated from the cold store.

(2) Installations should not pass unprotected through combustible sandwich panels. The appropriate design is, for example, in a floor concrete slab. If such a solution is not possible and the water must pass through combustible plates, the passage (the middle of the plate) must be protected by non-combustible materials.

(3) Depending on the fire response class of the plate, the size of the cold store and the need to install active fire protection is determined as set out in Table 34. If Class A1 or A2-s1,d0 panels are used, the requirements are the same as for racking warehouses or VRS.

(4) The entire construction of the room should be made of non-combustible materials.

(5) The space between the insulating panels and the façade or roof must be such that it can be set aside.

(6) In addition to the requirements of this Technical Guideline, additional requirements of VdS 2032 or CEA 4050 should be taken into account.

Table 34: Sizes of fire sectors of cold stores depending on the type of wall and ceiling panels

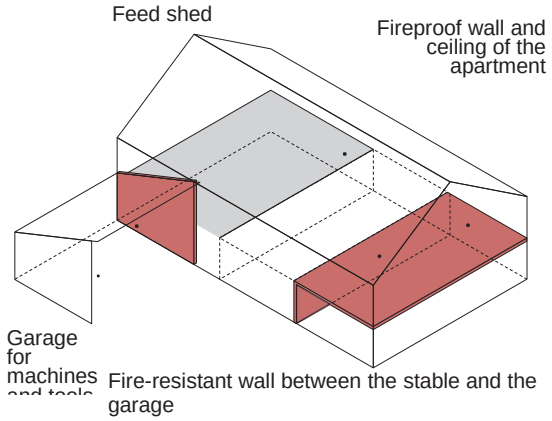
			The size of the cold store			
Type of wall and ceiling panel or insulation		storage height- upper edge of stored material and combustibility of coolant	< 10 m^2	> 10 in < 1000 m^2	> 1.000 m^2 and < 6.000 m^2	> 6,000 m^2
Non-combustible		Consideration of requirements as for conventional warehouses				
Combustible	B-s2, d0	Storage height: < 7.5 m and non-combustible coolant	No requirements	AJP inside and outside the cold store	automatic extinguishing inside and outside the cold store	It is not possible to use engineering methods.
	B-s2, d0	Storage height >	automatic	automatic	automatic	not allowed

		7,5 m or combustible coolant	extinguishing inside and outside the cold store	extinguishing inside and outside the cold store	extinguishing inside and outside the cold store	
	Free placement of insulation, minimum classification E or boards not corresponding to B-s2,d0	Storage height: < 4.5 m	AJP inside and outside the cold store	automatic extinguishing inside and outside the cold store	automatic extinguishing inside and outside the cold store	not allowed
	Free placement of insulation, minimum classification E or boards not corresponding to B-s2,d0	Storage height: > 4,5 m	not allowed	not allowed	not allowed	not allowed

2.11.18 Non-residential agricultural buildings

(1) Parts of a second-purpose building must be fire-separated from the farm machinery house or warehouse by a structure with a fire resistance class of at least EI 90. The house must be fire-separated from the machinery depot by at least EI 60. Feedingstuffs for animals may be stored in the same fire sector as the shed. An example of the implementation of an apartment with a stable is shown in the drawing 23.

(2) Houses or storage rooms for agricultural machinery must not contain spaces for the storage of motor fuels or heating fuels (including chips, pellets, wood, etc.) provided that they are not separated by a fire resistance class construction of at least EI 90.



Drawing 23: Example of the implementation of an apartment with a stable

(3) Consideration shall also be given to the requirements of point 2.4.4.1.

2.11.219 Electrical energy storage units (HEEs)

For HHE, see additional requirements of SZPV Guideline 417

3 EVAUCATION AND PUBLICATION AND ALARMING SYSTEMS

3.1 INTRODUCTION

Article 5

Evacuation routes and fire reporting and alarm systems

(1) Buildings must be designed and constructed in such a way that, in the event of a fire, a sufficient number of suitable escape routes and exits are available at suitable locations to allow users to leave the building quickly and safely.

(2) Where necessary in view of the design, location, destination and size of the building, fire alarm and alarm systems must be installed to ensure the rapid and safe evacuation of building users and the rapid intervention of firefighters in the building.

(1) This point of the Technical Guidelines sets out the requirements for the design of escape routes and fire alarm and alarm systems.

(2) This point does not concern the requirements for firefighters' access to buildings, which are addressed in point 4 of this technical guideline. It should be borne in mind that, as a rule, the evacuation route is also the way for firefighters to access the building and the way for firefighting and rescue in the building.

(3) For the requirements for firefighter lifts, see also point 4 of this technical guideline.

(4) For smoke and heat extraction requirements and requirements for materials and construction products on escape routes, see also point 2 of this Technical Guideline.

3.2 EVACUATION PATHWAYS

3.2.1 Basic requirements

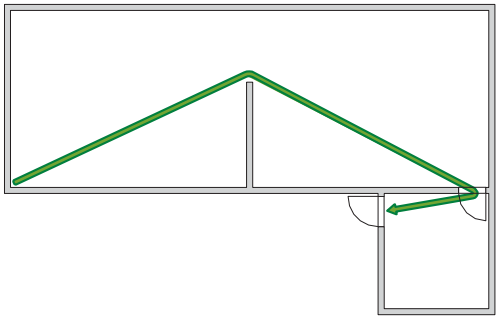
(1) The evacuation route must be designed in such a way that it represents the shortest possible way for users to withdraw from the endangered premises in the building to a safe place.

(2) The design of escape routes shall take into account:

- number of users,
- number and size of floors,
- the area and function of the building and its division into fire sectors,
- the installation of a fire alarm and alarm system (point 3.5) and/or an automatic extinguishing system (point 2.9), and
- the height of the rooms.

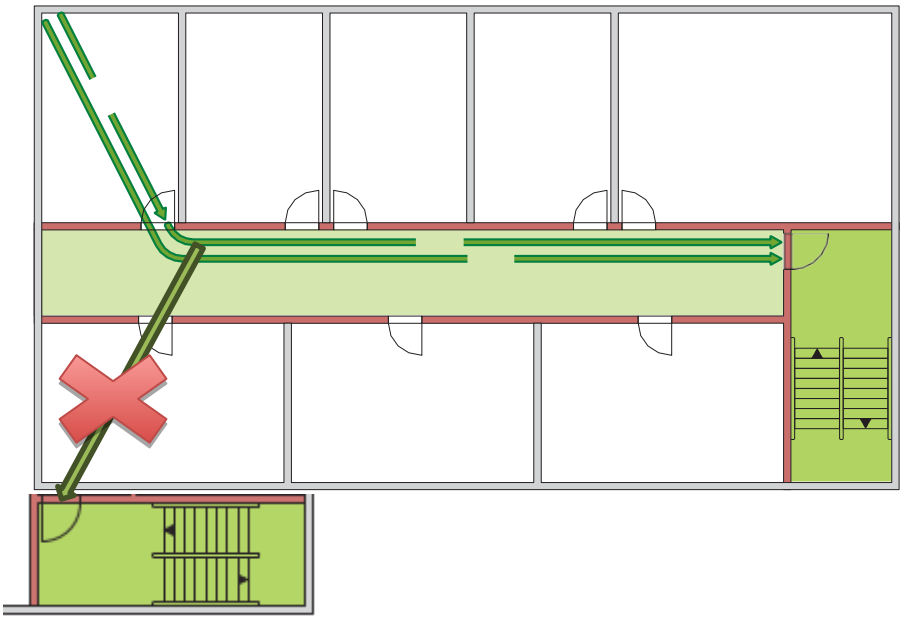
(3) The total length of the escape route means the sum of the lengths of the route from the furthest point in the room to the exit to a safe place or to a protected staircase (see drawings 24). If the stairway is not protected, the evacuation route through the stairway shall be counted towards the total length of the evacuation route. The length of the route along the unprotected parts of the horizontal evacuation route and along the protected corridor shall be counted towards the total length of the evacuation route.

(4) The length of the escape route through the protected staircase to the exit to the safe place shall not be counted towards the total length of the escape route.



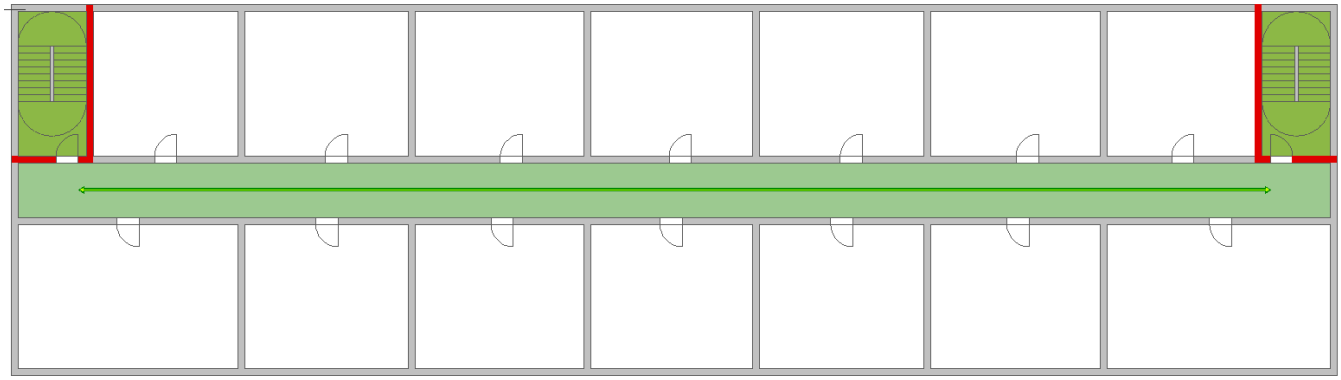
Drawing 24: Total length of escape route

(5) The exit to a safe place or a protected staircase must be accessible directly from the room (from which evacuation is planned) or from the common corridor (drawing 25). It is not allowed to pass from the corridor through another room (e.g. office, hospital room, warehouse) to a protected staircase. Passage from a common corridor through a protected or unprotected corridor (only to be used as an unequipped corridor) to a protected staircase or exit to a safe place is permitted.



Drawing 25: Example of inadequate evacuation route through another room

(6) If the evacuation route leads to two protected stairways or exits to a safe place via a common corridor without fires, smoke or building separations in the corridor (wall, door), the length of such evacuation route shall be measured as the evacuation route in one direction, regardless of the fact that two directions of evacuation (two stairways or two exits to a safe place) are possible. See example in drawing 26. The length of the escape route shall be measured from the furthest point to the nearest staircase.



Drawing 26: Example of an evacuation route through an unprotected common corridor

(7) Where an evacuation route leads to two or more protected stairways or exits to a safe place, either directly or through independent corridors, the length of such evacuation route shall be measured as an evacuation route in two independent directions (drawing 27). In this case, no space other than a sheltered or unprotected corridor should be used (e.g. warehouse, delivery). If an evacuation route passes through such spaces (e.g. delivery), the length of that evacuation route shall be measured as a one-way evacuation route.

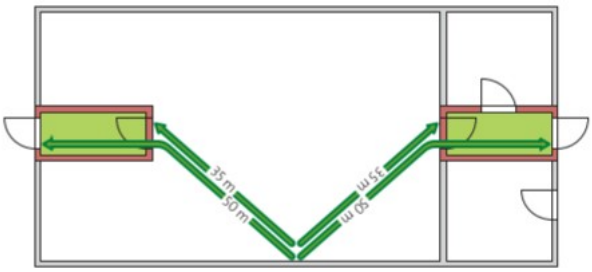


Figure 27: Example of a two-way evacuation through two independent corridors

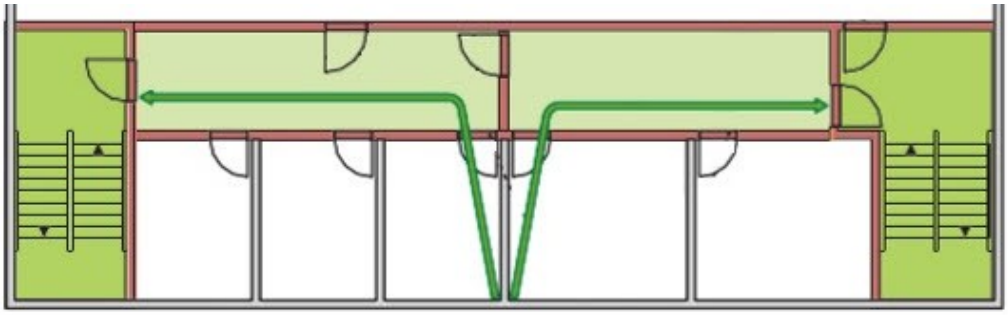


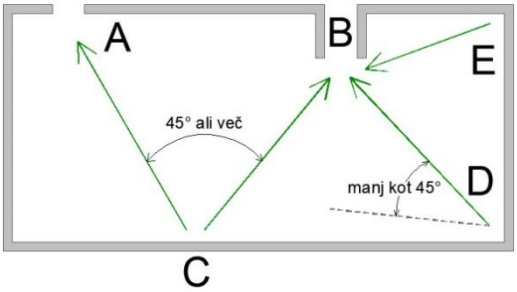
Figure 28: Example of evacuation from a room in one direction, the hallway is divided into two parts due to the length of the hallway more than 50 m. In this case, the hallway is not considered a blind hallway, because the hallway has two directions of evacuation.

(8) Hallways can be protected or unprotected. In the case of unprotected corridors, they must be structurally separated from rooms (e.g. offices), flammable equipment is not allowed in the corridors, walls and ceilings must be made of a minimum of difficult-to-combustible materials.

(9) Hallways can be considered independent if they are separated by building elements (wall, door with self-closing) and evacuation from each corridor leads to another independently protected staircase. The wall and doors in the hallway can be without fire resistance or fire resistance, depending on the built-in active fire protection systems and the size of the sectors. The door must have a self-closing device connected to the AJP system.

(10) Hallways are considered as blind corridors if evacuation is possible only in the direction of one protected staircase or exit to a safe place.

(11) A space can be considered as a space with two independent exits if the angle between the exits from any point of the space is greater than 45 degrees (see drawing 29). The angle may be smaller if any point of the room is not more than 20 m from at least one door and the door is not less than 5 m apart. Exits may be connected to one corridor, unless otherwise required in other parts of this guideline.



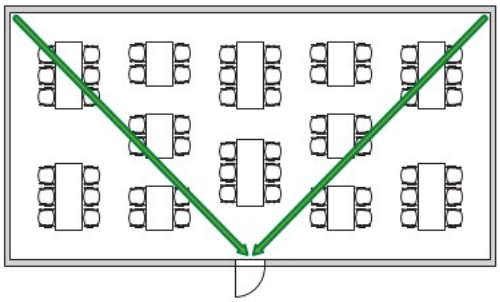
N.B.: CA and CB evacuation routes can be considered as two-way evacuation routes. The evacuation route DB and EB cannot be considered as an evacuation route in two directions.

Drawing 29: Space with two independent exits

(11) A protected staircase must have a direct exit to a safe place. If a protected staircase does not have a direct access to a safe area, a protected corridor to which the same requirements as for a protected staircase apply (see point 3.2.2.2) shall be provided. Where more than one protected stairway is required, the protected stairways shall be fire-separated and the exits from those stairways fire-separated and independent.

(12) Where no fire separation is required between the protected staircase and the corridors, the same requirements as for the protected staircase shall apply to the corridors with regard to fire resistance and reaction to fire of walls and doors and ceiling, wall and floor materials.

(13) In rooms, the length of the path is measured in a straight line, but not through building elements or fixed objects (e.g. amphitheatre classrooms, large industrial machines), see drawing 30, and in the corridor by its axis.



Drawing 30: Measuring the length of the path in the room

(14) Equipment may not be placed on protected parts of escape routes. Equipment that achieves the permitted fire response class according to point 2.4 and does not obstruct the escape route (e.g. cannot roll over) and does not interfere with the width of the escape route is permitted. Fire extinguishers can reach the width of the escape corridor, and smaller electrical equipment such as switches and hand beacons and door frames can reach the corridors and staircases. Internal hydrants must be positioned in such a way that they do not reduce the width of the escape routes.

3.2.2 Number and arrangement and length and width of escape routes

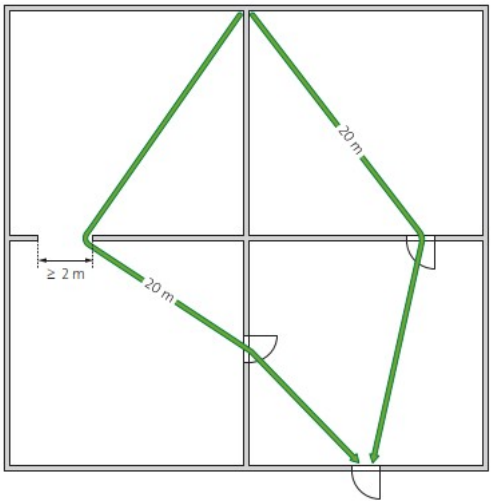
3.2.2.1 Length of escape routes

(1) The length of the escape route depends on the location of the active fire protection systems and the height of the rooms. Extension of the escape route due to the height of the space in paragraphs 2, 3 and 4 is not allowed in the case of atriums (e.g. the escape route partly passes through the atrium). In the case of open galleries or landings, the extension of the escape route may be taken into account if the height of the space is measured from the landing or gallery to the ceiling.

(2) In the absence of an automatic fire alarm system in the building in terms of full protection in accordance with point 3.5, or in the absence of an automatic extinguishing system in the building in terms of full protection in accordance with point 2.9, the maximum lengths of escape routes may be:

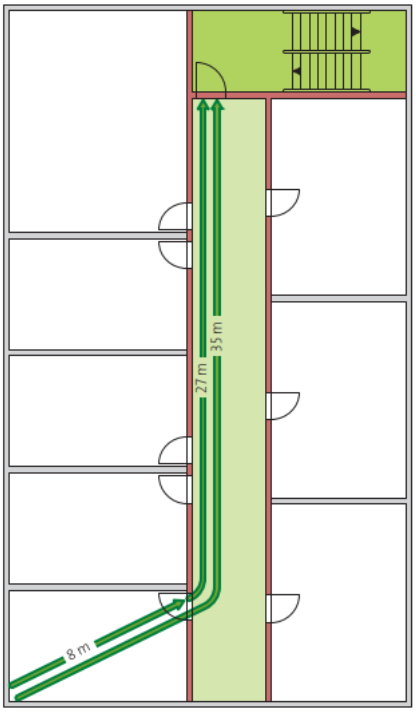
- If the escape route leads in one direction from the farthest point of the space to the exit to a safe place or

to a protected staircase, the length of these parts of the escape route shall not exceed 20 m (see drawing 31).



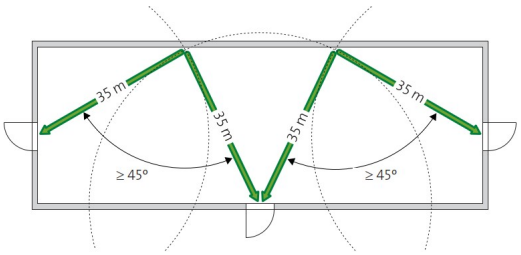
Drawing 31: Length of escape route from single-exit rooms to escape to a safe area or secured stairway

- If the escape route leads in one direction from the outermost point of the space to a protected corridor and through a protected corridor to an exit to a safe place or a protected staircase, the length of the escape route to the protected corridor shall not exceed 20 m and the total length of the route from the outermost point of the space together with the protected corridor shall not exceed 35 m (see drawing 32).



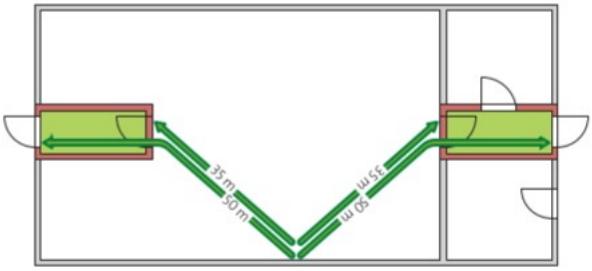
Drawing 32: Arrangement of the escape route to one exit to a safe place without an AJP with a protected corridor

- Where evacuation routes from the outermost point of the space lead in two directions to two or more independent exits to a safe place or to two or more independent protected stairways, the length of these parts of the evacuation routes shall not exceed 35 m (see drawing 33).



Drawing 33: Length of escape routes from multi-exit room to safe area

- Where escape routes lead from the outermost point of the space in two or more directions into different protected corridors, the length of these parts of the escape routes within the space shall not exceed 35 m and, together with the protected corridor, up to 50 m (see drawing 34). A sheltered corridor must have an exit to a safe place or to a sheltered staircase, and the escape route inside the corridor may be extended by a maximum of 15 m (blind corridor).



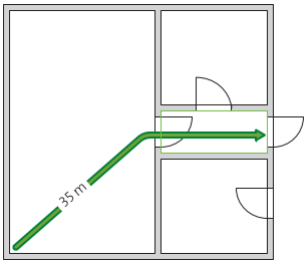
Drawing 34: Length of escape routes from multi-exit room to safe area

In rooms where the clear height of the rooms is more than 7,5 m and the escape route leads directly to a protected staircase or to an exit to a safe place, the length of the escape routes in one direction to one exit to a safe place or to a protected staircase may be extended up to 35 m. The length of the escape routes in the room in two or more directions to several independent exits to a safe place or a protected staircase may be extended up to 50 m. In the case of ceiling heights above 5 m and up to 7,5 m, interpolation in the case of two directions of evacuation is permissible. The escape route shall not be extended if the escape route passes through other premises.

Example: Ceiling height is 6 m. The evacuation route can be extended by 1 m/2.5 m x 15 m= 6 m, the maximum evacuation length is 35 m + 6 m = 41 m.

(3) Where a building is fitted with an automatic fire alarm system in the sense of full protection in accordance with point 3.5 or an automatic extinguishing system in the sense of full protection in accordance with point 2.9, the maximum lengths of escape routes may be:

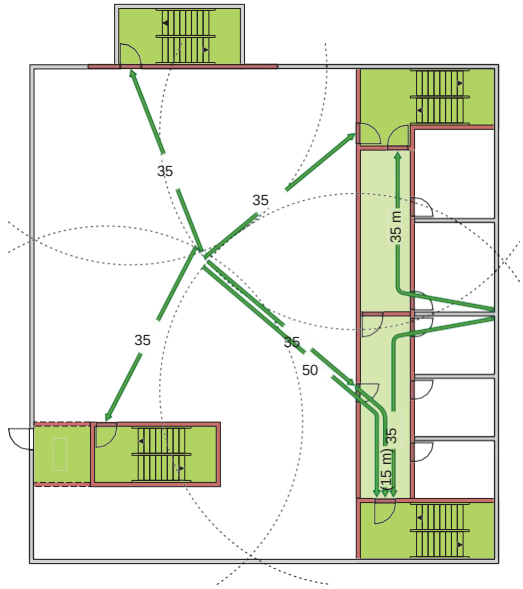
- If the escape route leads in one direction from the outermost point of the space in the room or from the space through the corridor to the exit to a safe place or to a protected staircase, the length of these parts of the escape route shall not exceed 35 m (see drawing 35).



Drawing 35: Arrangement of the escape route to one exit to a safe area by means of an AJP or sprinkler system

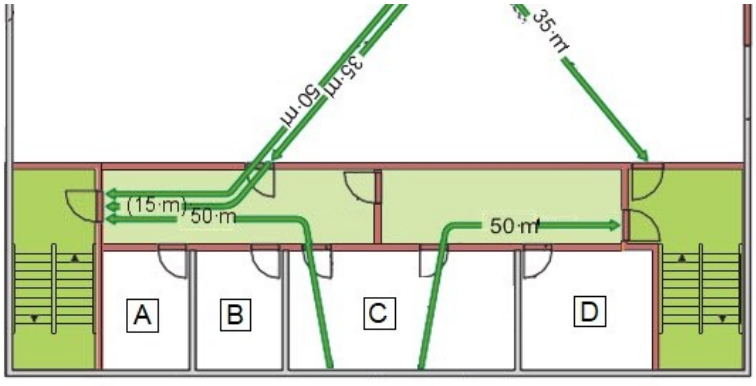
Example: The evacuation route leads from the room to an unprotected corridor and along it to one exit to a safe place (built-in AJP in accordance with pt. 3.5 or AGS in accordance with point 2.9).

- Where escape routes lead from a space in two or more directions to two or more exits through independent corridors (unprotected or protected) to a safe place or a protected staircase, the length of the escape route to the corridor shall not exceed 35 m and, together with the corridor, up to 50 m, the escape route within the corridor may be extended by a maximum of 15 m (blind corridor, see drawing 36).



[1]) Unprotected/Protected corridor on the floor at the level of the exit to a safe place must meet the same requirements as the protected staircase

Drawing 36: Length of escape routes to multiple exits to a protected stairway



N.B.: The hallway is treated as an unprotected hallway. Spaces A, B, D have a maximum length of the evacuation route to the staircase of 35 m, space C has the possibility of evacuation in two independent directions, the length of the evacuation route is maximum 50 m. The corridor has the possibility of exiting in two directions and is not treated as a blind corridor.

Drawing 37: Length of escape routes from space through unprotected/protected corridor to multiple exits

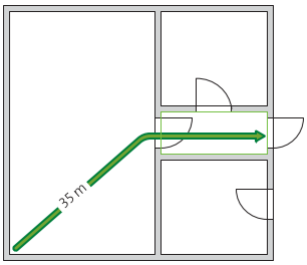
In rooms where the clear height of the rooms is more than 7,5 m and the escape route leads directly to the protected staircase or to the exit to a safe place, the length of the escape routes to several exits to the safe place or to the protected staircase may be extended in the case of two independent routes up to 50 m. The escape route in one direction may not be extended. In the case of ceiling heights above 5 m and below 7.5 m,

interpolation is permissible. The escape route shall not be extended if the escape route passes through other premises.

N.B.: In accordance with point 2.11, a building is still to be understood as a building with full protection if the detectors are not installed in apartments, they are installed in all common parts of the building.

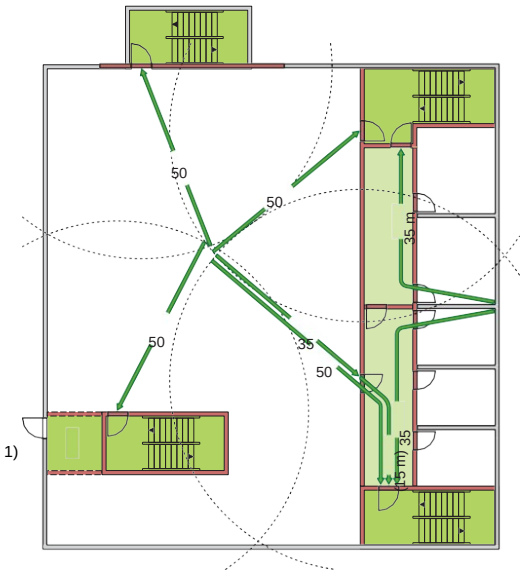
(4) Where a building is fitted with an automatic fire alarm system in the sense of full protection in accordance with point 3.5 and where a building is fitted with an automatic extinguishing system in the sense of full protection in accordance with point 2.9, the maximum lengths of escape routes may be:

- Where escape routes lead in one direction from spaces or from a space through a corridor to an exit to a safe place or to a protected staircase, the length of these parts of the escape route shall not exceed 35 m (see drawing 38).



Drawing 38: Length of escape routes in one direction

- Where evacuation routes from the outermost point of the space lead in two directions to several exits to a safe place, to a protected stairway, to corridors (protected or unprotected) leading to protected stairways, the length of these parts of the evacuation routes shall not exceed 50 m (see drawing 39).



1) Unprotected/Protected corridor in the floor at the level of the exit to the safe place must meet the same requirements as the protected staircase

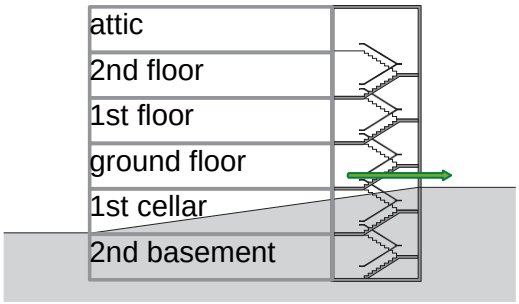
Drawing 39: Length of escape routes in two directions within a larger space and in one direction across the corridor

In rooms where the clear height of the rooms is more than 7,5 m and the escape route leads directly to a protected staircase or to an exit to a safe place, the length of the escape routes may be extended up to 70 m in the event of two or more exits to a safe place or to a protected staircase. The escape route in one direction may not be extended. In the case of ceiling heights above 5 m and below 7.5 m, interpolation in at least two directions of evacuation is permissible. The escape route shall not be extended if the escape route passes through other premises.

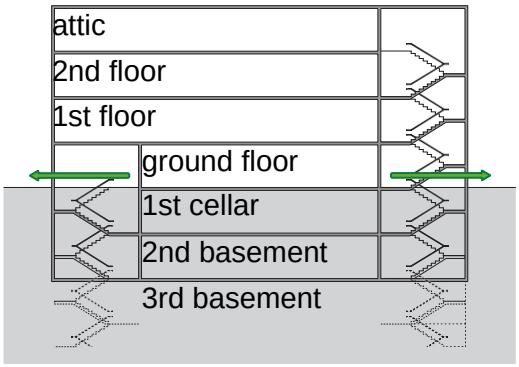
3.2.2.3 Number and arrangement of staircases

(1) If evacuation routes lead to one protected staircase, the BTP of this level shall be less than 900 m² (see drawing 40). If the BTP level exceeds 900 m², the evacuation routes shall lead to at least two protected independent staircases.

(2) Notwithstanding the preceding paragraph, evacuation routes in buildings with spaces for many users located on floors or underground floors must lead to at least two protected independent stairways (see drawing 41).



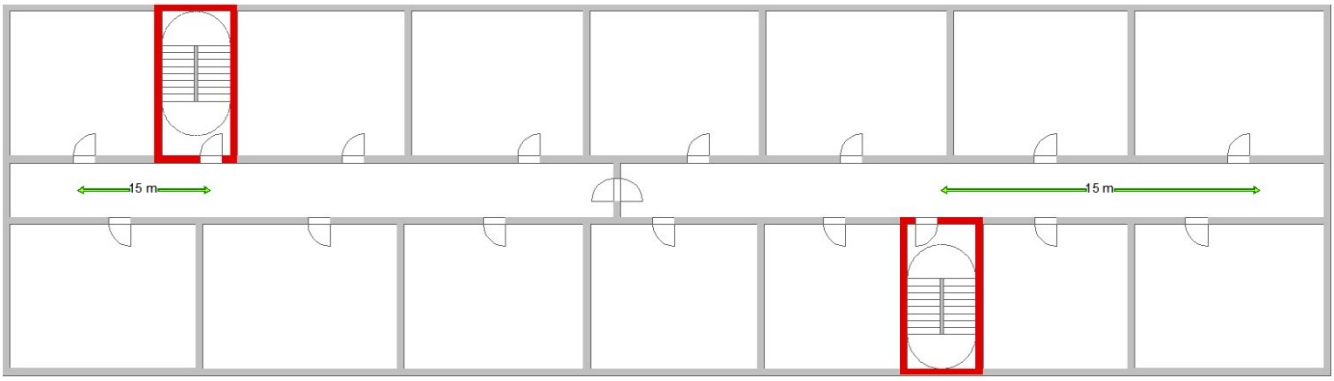
Drawing 40: Protected staircase in a building with a BTP of individual floors less than 900 m²



Drawing 41: Example of the implementation of protected staircases in a building with a BTP floor of less than 900 m² and space for many users in the 2nd basement

(3) In the case of a requirement to perform two or more staircases, the staircases must provide for:

- In the case of exits directly onto staircases to take into account the required angle and distance between exits (see point 3.2.1)
- In the case of exits from a corridor, that part of the corridor (blind corridor) with one direction of evacuation has a maximum distance of 15 m between the exit door from the room and the door of the staircase (the requirements regarding the length of the evacuation route in one or two directions remain unchanged),

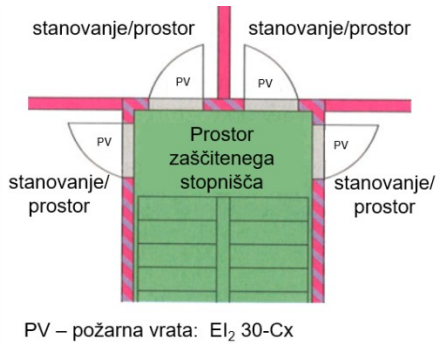


Drawing 42: Maximum blind corridor length in case of two protected staircases

(4) Stairways must be designed in such a way that the staircase core represents one volume. The staircase must be designed as a single fire sector.

(5) In each floor, a maximum of four rooms can be connected to the staircase (e.g. apartments, corridors, technical rooms, shafts with doors), drawing 43. The maximum depth of the landing is two times the width of one shoulder of the staircase.

Example: The width of the staircase shoulder is 120 cm, the total width of the staircase is 240 cm, the maximum depth of the space in the floor connected to the staircase is 240 cm.



Drawing 43: Demonstration of the implementation of a staircase that is directly connected to several rooms

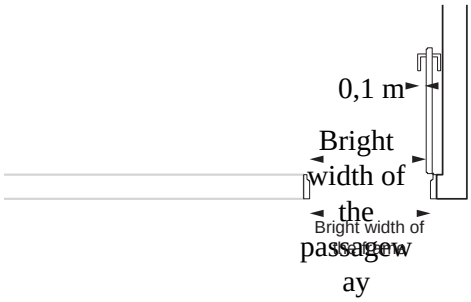
3.2.2.4 Widths and heights of escape routes

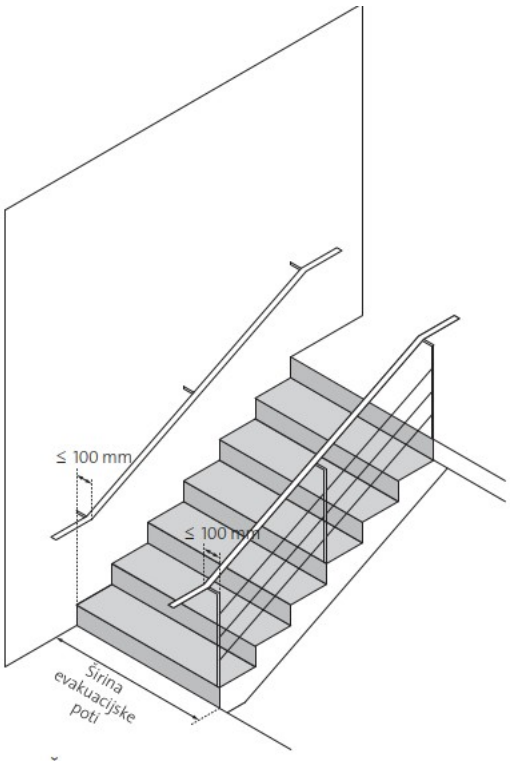
(1) The width of the escape route shall be measured:

a) at the door as the bright width of the door (see drawing 44),

b) in the hallways as the bright width of the hallway,

c) on stairways, as the width of the walking surface of the stairway (see drawing 44).





Drawing 44: Measuring the bright width of the door and the width of the trekking surface of the escape route

(2) Stairways and corridors along escape routes shall have a minimum clear width of 1,2 m, unless a lower width is permitted in other parts of this guideline. Corridor installations, equipment or devices shall not reduce the width of corridors and stairways. If the width of the hallway is greater than required, the required width of the hallway must be indicated in the floor plan of the floor.

(3) The light width of the hallway minimum 1.2 m should be considered:

- if there is an escape route through the corridor from at least two spaces (permanent unoccupied spaces are excluded)
- Indoors if at least 5 people are evacuated through the corridor (e.g. open offices, industry)
- if there is an escape route through the corridor from one space and an escape corridor width of 1,2 m is required in that space;

If less than 5 people are evacuated through the hallway inside the room, the minimum width of the hallway should be 80 cm.

(4) The clear width of stairways on escape routes may be reduced to a minimum of 1,0 m if all conditions are met:

- the staircase connects a maximum of two floors above the ground and/or one floor below the ground
- The size of the building is up to 600 m2
- the building is used for purposes such as residential, industrial or office use, non-residential agricultural buildings (112, 122, 125, 1271 to 1273)
- no more than 20 persons are evacuated from all floors together via a staircase

(5) The clear width of stairways on escape routes may be reduced to a minimum of 0,8 m if both conditions are met:

- the staircase connects a maximum of two floors and
- the staircase is intended for access to technical spaces such as ventilation machinery space, lift machinery space, heat station;

(6) The clear height of corridors and stairways forming an integral part of the escape route shall be at least 2,1 m. The clear height of the doors shall be at least 2 m.

(7) The building can be divided into several evacuation sectors. An evacuation sector is considered to be simultaneously alerting and thus evacuating the entire evacuation sector (e.g. alarming via sirens). For smaller buildings, the whole building may be a single evacuation sector, while for larger buildings, the building may be

divided into evacuation sectors according to the floor level or the building floor size. In the case of fire-separated floors, the evacuation sector does not specify the width of the evacuation routes.

(8) The width of the door is determined by the number of persons who will evacuate through the door. The width of the exit door from the staircase is determined according to the floor with the highest number of persons, and if several floors are grouped into one fire sector, according to the number of persons from the floors connected to this fire sector (if this number is greater than the number of persons from other floors).

(9) The width of the staircase is determined according to the floor (as a rule, each floor is fire-separated from the rest of the floors) with the maximum number of persons. If floors are in the same fire sector or evacuation from one room takes place across different floors (e.g. hall stands), the width of the staircase is determined with respect to the simultaneous evacuation of all floors connected to one fire sector. If a building is divided into several fire sectors by floor, the whole building may still be one evacuation sector, but there is no need to take into account the aggregation of persons on different floors located in different fire sectors.

Example: The building is separated into fire sectors by floors. 60 people are evacuated from the third floor via the staircase in question (the floor with the largest number of people). The width of the door from the third floor to the staircase is 0.9 m, the staircase is 1.2 m wide, the exit door from the staircase is 0.9 m.

(10) The width of the escape route required by the number of persons shall not be reduced along the escape route.

(11) Required exits from premises:

(a) up to 5 users: Output width 0.8 m

(b) up to 50 users: one output of 0,9 m width

(c) up to 100 users: Two outputs of 0.9 m width each

(d) up to 200 users: three outputs with a width of 0,9 m each, or two outputs, one with a width of 0,9 m and the other with a width of 1,2 m

(d) over 200 users: at least two outputs of 1,2 m width, the total width of all outputs shall be calculated taking into account the location of the floor where the room is located:

i) all floors: 0.6 m per 100 users (n_e = 100)

$n = n \times 0.6 / n_e$

where it is

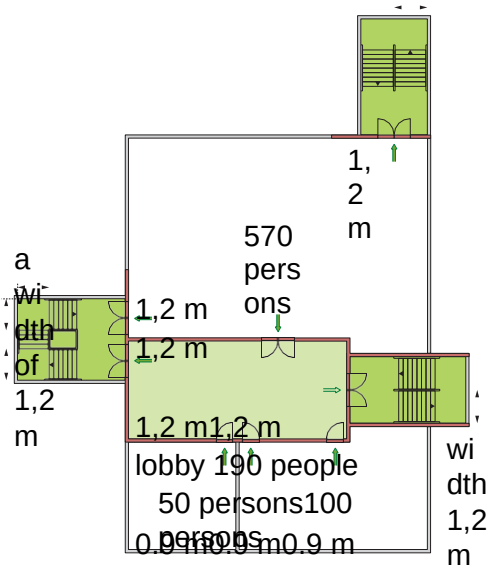
No … width of outputs,

n … is the actual number of users in a room or several rooms (see pt. 3.2.1 (12)),

n_e … is the computational number of users in a room or several rooms.

If, according to calculations, the width of exits, stairways and corridors is greater than 1,2 m, the intermediate values of the multiple of this width shall be interpolated (see drawing 31).

(12) The minimum width of doors to apartments is 0.8 m. The minimum width of exits from commercial premises with BTP up to 50 m^2, is 0.8 m. If there are no persons in the premises and regular maintenance operations, services or inspections are not required in the premises, the width of the doors is at least 0.7 m. The maximum width of the door leaf is 1.2 m.



Evacuation routes from spaces for many users and other spaces:

- the lobby is executed as a fire-separated room, a protected hallway,
- In accordance with TN. 3.3 (2) lead two exits with a total light width of 3,42 m from the space for 570 persons directly in the protected staircase (2/3 of the total exit width),
- In accordance with TN. 3.3 (2) lead one exit with a bright width of 1.2 m from the space for 570 persons to the protected staircase via the lobby (1/3 of the total exit width),
- In accordance with TN. 3.2.3.1 (2) the prescribed clear width of the way on stairway landings shall not be limited by the open wings of the door,
- In accordance with TN. 3.2.2.4 (7) an evacuation route from different fire sectors passes through the lobby, so its width is determined by the requirements for the width of the exit from the floor with the largest number of users.

Drawing 45: Demonstration of the determination of required widths of exits, corridors and stairways

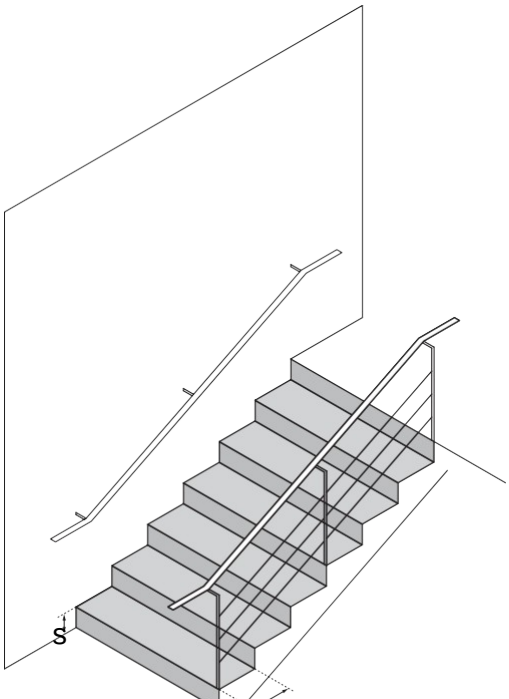
3.2.3 Execution of evacuation routes

3.2.3.1 Stairs and ramps

(1) The requirements of this technical guideline do not apply to stairs and ramps inside apartments. Inside the apartments, different designs of corridors, staircases and staircases as required by this Guideline, such as circular staircases or other twisted steps, are also allowed.

(2) The height and depth of all stairs must be the same. Stairs must be made in accordance with the requirements of drawing 46. The floor treatment of the stairs should be solid, stable, non-slip, continuous and dry (the properties should not change if the floor surface gets wet). The step forehead must be flat so that the foot does not become stuck to the overhanging part (see drawing 46).

(3) The required luminous width of the path along the landing should not be limited. If the door is opened in the direction of a staircase, the opening of the door leaf must not impede evacuation through the staircase (see drawing 48). The requirement does not need to be respected if there is no evacuation from other floors after the landing (e.g. for the lowest basement floor or the highest floor).

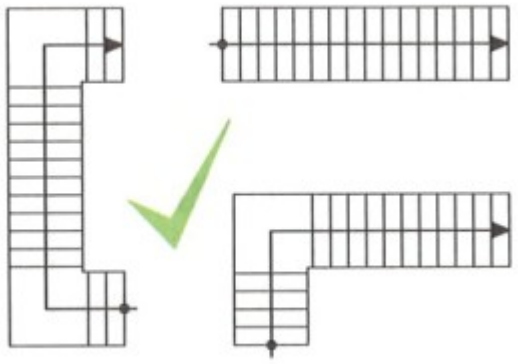


Dimensions of stairs:

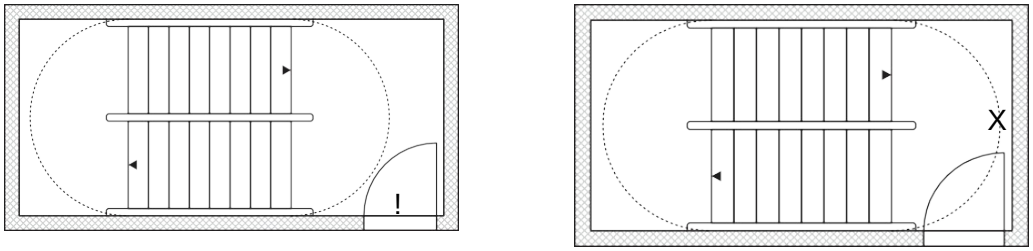
Stairs must meet the following requirements:

2 s + a = 0,63 m (tolerance: 0,62 – 0,65 m)
S + a = 0,46 m (tolerance allowed: 0,45 – 0,47 m)

Drawing 46: Requirements for evacuation route steps



Drawing 47: Execution of landings on evacuation routes

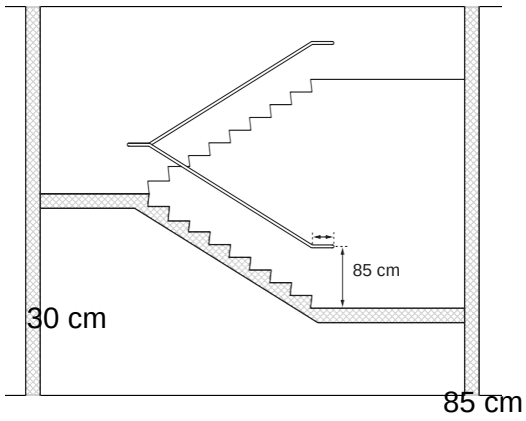


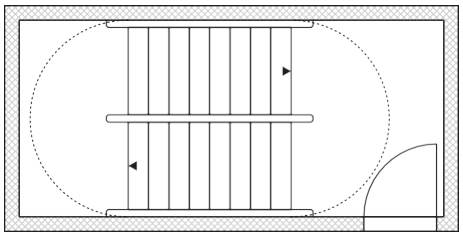
Drawing 48: Bright path width on the landing

(3) Handles must be fitted on both sides (see drawings 44 and 46). Staircases with a bright width of more than 2.4 m must also have a handrail in the middle. The handle must have good grip — the attachments must not prevent the hand from sliding over the handle (see drawing 46).

(4) Only a stairway with at least three steps is allowed on the escape route. A smaller number of stairs is allowed in industrial facilities and on staircases through which less than 10 people are evacuated. In staircases with up to five steps, the steps shall be marked, e.g. by yellow, shiny or otherwise colour-extinguishing strips. In places where the direction of the stairs changes, there should be landings. The floors on the staircase must also be at the level of each floor and 20 stairs.

(5) ramps on escape routes shall not have a gradient of more than 6 %.





Drawing 49: Requirements for handles on staircases

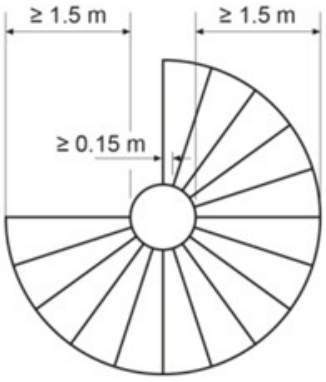
(7) Circular and twisted stairs are allowed as a protected or unprotected evacuation route in commercial or administrative buildings (CC SI 122) and residential buildings (CC SI112), provided that the staircase meets the following conditions:

- if no more than twenty users use this route

-the staircase connects up to three floors

- the width of the staircase (over the entire length including any landings) must not be less than 1,5 m,

- the length of the step at the narrowest part must not be less than 0,15 m (see drawing 50).



Drawing 50: Requirements of the circular staircase

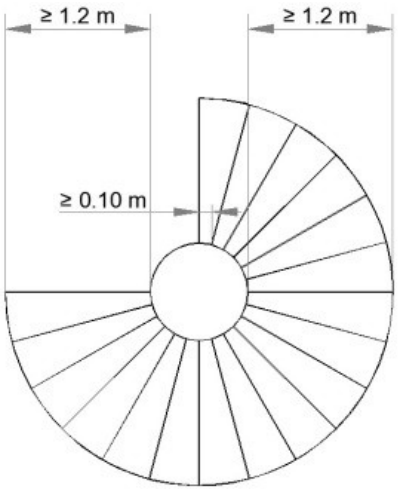
(7) Circular and twisted stairs are allowed as an unprotected evacuation route within the premises of catering (CC SI 121), industrial (CC SI 125), office or administrative buildings (CC SI 122), 123 Commercial buildings and buildings for service activities, provided that the staircase meets the following conditions:

-if no more than ten users use this route,

-the staircase connects up to two floors,

- the width of the staircase (over the entire length including any landings) must not be less than 1,2 m,

- the length of the step at the narrowest part shall not be less than 0,10 m (see drawing 51).



Drawing 51: Requirements of the circular staircase

3.2.3.2 Protected stairways

(1) The protected staircase must be fire-separated from the rest of the building as specified in point 2 of this Technical Guideline. Doors from other fire sectors to protected stairways shall have fire resistance class EI $_2$ 30-Cx or EW 30-Cx if there is a fire load up to 250 MJ/m ^{2} in the space adjacent to the stairway.

(2) External stairways (see drawing 52) are considered to be protected if they are fire-proof in the building, i.e. arranged in such a way that:

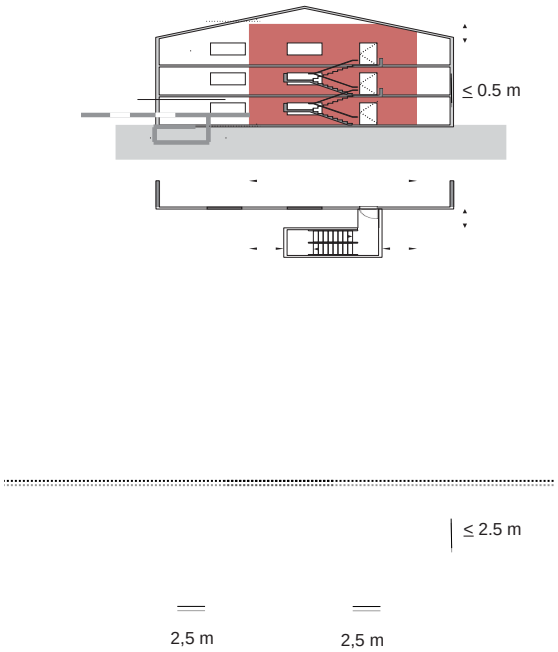
- the guaranteed fire resistance class of the wall, as required for fire separations in the building, but not less than EI 30, and openings of at least EI 30 at a distance of up to 2,5 m around the external staircase throughout the height of all floors connected to it,
- the façade in a width of not less than 2,5 m to the staircase must be of materials with a reaction to fire of Class A1 or A2-s1,d0,
- a fire resistance class of door accesses to external staircases of not less than EI $_2$ 30-Cx, except in the case of accesses from protected corridors where it is sufficient that the door is equipped with a self-closing device,
- access to a safe area must be provided from an external staircase. Exit doors shall meet the requirements of point 3.2.3.5 of this Technical Guideline.

The distance of 2,5 m around an external staircase may be reduced to 1,5 m if, in all floors adjacent to the external staircase, the fire load is below 1 000 MJ/m ^{2}.

(3) Where stairways are more than 2,5 m from the façade, they shall be considered to be protected if they are arranged:

- the guaranteed fire resistance class of the wall, as required for building fire separations, but not less than EI 30, and apertures of at least EI 30 within a distance of up to 1 m around the exit throughout the height of all floors connected to it,
- the façade shall be at least 2,5 m wide around the stairway exit, made of materials with a fire response of Class A1 or A2-s1,d0,
- a fire resistance class of door accesses to external staircases of not less than EI $_2$ 30-Cx, except in the case of accesses from protected corridors where it is sufficient that the door is equipped with a self-closing device,
- access to a safe area must be provided from an external staircase. Exit doors shall meet the requirements of point 3.2.3.5 of this Technical Guideline.

The distance of 2,5 m around an external staircase may be reduced to 1,5 m if, in all floors adjacent to the external staircase, the fire load is below 1 000 MJ/m ^{2}.



Drawing 52: Execution of the external staircase

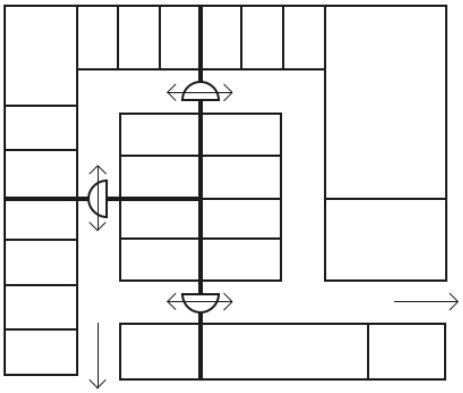
(4) There should be no decorations and flammable equipment on the protected staircases and in the vestibules of the staircases. In these rooms, within the prescribed width, the disposal of any objects is prohibited. Equipment may be placed in these rooms as long as it does not reduce the escape route and is fixed.

3.2.3.3 Protected and independent corridors

(1) Protected corridors shall be fire separated from the rest of the building by walls with a fire resistance class of at least EI 30 or the same as required for the supporting structure of the building, doors to the protected corridor shall have a fire resistance class EI_2 30-Cx or EW 30-Cx if the fire load in the space adjacent to the corridor is less than 250 MJ/m^2.

(2) Protected corridors longer than 50 m shall be divided into two fire sectors by elements of reaction-to-fire class EI_2 30 or EW 30 in such a way that the lengths of the escape route differ as little as possible (see drawing 53). The separation must be carried out over the entire width of the building in the execution of at least EI 30.

If the hallway is executed as a protected hallway, a fire separation in the protected hallway is enough (no fire separation to the facade is required.



Drawing 53: Fire separation in the hallway, separation is carried out to the facade or another sector

(3) In the case of independent corridors not protected by fire, doors with self-closing only (automatic closing via the AJP system or sprinkler system) are allowed.

(4) In the protected hallways there should be no decorations and combustible equipment. In these rooms,

within the prescribed width, the disposal of any objects is prohibited. Equipment shall be placed in protected and/or independent corridors as long as it does not reduce the escape route and is fixed.

3.2.3.4 Evacuation balconies and bridges

(1) A balcony or bridge can be considered as an evacuation route if the facade or roof of the building on which it is built or connected is constructed of non-combustible materials (class A1 or A2-s1,d0). If there is an evacuation route across the roof, the insulation of the roof must be made of non-combustible materials and the structure and roof must have the fire resistance required for evacuation staircases.

(2) The path must lead to the exit to a safe place or to a protected staircase. The requirements concerning the permissible total length of the escape routes must be complied with. The walking surface of the balcony or bridge must be built of non-combustible materials.

(3) If the balcony or bridge leads to only one exit to a safe place or to a protected staircase, the structure must have a fire resistance of class R 30 and the walking surface must not have openings. Openings in the façade by which the escape route passes must be carried out in a fire-resistant version of the same class as required for the load-bearing structure, doors of at least EI_2 30Cx. If a balcony or bridge leads to two or more exits to a safe place or to a protected staircase, the fire resistance of its structure is required and there are no requirements for the fire resistance of doors and windows, provided that each exit has two directions of evacuation.

(4) If the balcony or bridge is located on the outside of the wall, the wall of the balcony or each wall of the bridge must contain at least 50 % of the permanently open surfaces, which must be evenly distributed over their entire length and constructed in such a way that they cannot be closed.

(5) Evacuation balconies or bridges without fire-resistant doors may be connected to an open staircase provided that clearances are provided as in the case of an external staircase 3.2.3.2.

Doors on evacuation routes

(1) The door must open in the direction of evacuation. Exceptions are the doors:

- from rooms where a maximum of 5 users can stay at the same time,
- from premises where more than 5 and no more than 20 users can be accommodated at the same time and where the ratio of the maximum number of persons to the BTP space is not more than 0,3,
- from technical spaces free from danger, flammable liquids or gases and having a fire load below 250 MJ/m^2, from tool rooms and similar spaces.

Example 1: The packing room is 500 m^2, there are 15 persons employed in the room, the ratio of the number of persons to the square of the room is 15 / 500 = 0.03. The door can be opened in any direction.

Example 2: The meeting room is 50 m^2, 18 persons can be gathered in the room, the ratio of the number of persons and the quadrature of the room is 18 / 50 = 0.36. The door must open in the direction of evacuation.

(2) Depending on the number and characteristics of the users to be removed from the premises, doors must be fitted with closures in accordance with CNGV Guideline 416.

(3) Doors at exits to a safe place and from protected stairways must be such that firefighters can open them from the outside with their tools in an emergency.

(4) Automatic sliding doors on escape routes are only permitted if they meet the requirements of SIST EN 16005 (point 4.7.2) or CNGV guideline 413. If automatic doors do not meet the requirements of the preceding sentence, wing doors complying with the requirements of this point must be installed in their immediate vicinity. Automatic lifting, swivelling or roll-over doors shall not be permitted on escape routes (e.g. additional wing doors complying with the requirements of this Guideline shall be installed in their immediate vicinity).

(5) Fire or smoke-tight doors on escape routes which are normally in the open position shall be equipped with an automatic door closing system connected to the fire control centre in accordance with SIST EN 14637, the standard for electrically controlled systems for the automatic closing of fire or smoke-tight doors connected to the fire control centre.

(6) According to this guideline, evacuation doors are considered to be:

- having a defined direction of opening in the direction of evacuation
- who have requirements for fitting fittings in accordance with CNGV 416
- which, according to the requirements of this Guideline, must have a width of not less than 0,9 m

(7) The opening of evacuation doors along the escape route shall not be restricted for the purpose of access control or burglar protection of the building. The requirements of SIST EN 13637 for electrically controlled escape locking systems on escape routes shall be complied with.-

3.2.3.6 Safety lighting

(1) Requirements for the installation of safety lighting in buildings are given in Table 35. Safety lighting shall be installed if at least one of the conditions set out in this table is met: area, number of persons or number of beds.

(2) Except in the buildings or parts thereof referred to in the first paragraph, security lighting shall also be installed in the following buildings or parts of buildings:

- in all buildings with spaces for a large number of users,
- in all buildings with evacuation routes requiring the evacuation of more than 20 users and without daylight,
- in buildings such as stations, terminals, electronic communications buildings and associated buildings (CC – SI 1241) in public use,
- in buildings with rooms where work processes are carried out where failure of general lighting would lead to a fire hazard.

(3) Safety lighting shall be installed only in that part of the building which meets the conditions set out in the first or second paragraph of this point, provided that that part has independent escape routes from the remaining parts of the building and is fire-separated from them by building elements of at least the class required for the fire resistance of the load-bearing structure and at the boundaries of the fire sectors, but not less than (R)EI 60.

(4) If the installation of security lighting is required for a building or part of a building, it must be installed:

- on evacuation routes,
- at fire points (e.g. fire extinguishers, hydrants, important elements of active fire protection systems such as activators, control cabinets, first aid cabinets, etc.),
- in workplaces where failure of general lighting would create a fire hazard,
- in rooms larger than 50 m^2, with workplaces without permanent daylight,
- in rooms larger than 100 m^2, with daylight workplaces,
- in rooms where more than 50 persons can be gathered,
- on stages larger than 20 m^2,
- in changing rooms, toilets and break rooms larger than 50 m^2,
- in warehouses larger than 100 m^2,
- in kitchens and laundries larger than 50 m^2,
- in break rooms larger than 50 m^2,
- in spaces containing an electric generator, a central battery or an electric manifold, which are intended to power or control fire-fighting appliances.

(5) Security lighting must also be installed in public administration buildings (CC – SI 12201), where the headquarters of state bodies, branches of ministries or bodies in their composition or the headquarters of local communities are located, which must perform work in the event of natural or other disasters (e.g. police, military, protection and rescue, etc.). In these buildings, security lighting must be installed in the premises referred to in the fourth paragraph of this point and in any other premises relevant to the work of the Authority (e.g. meeting rooms, command and control rooms, communication rooms, etc.).

(6) Notwithstanding the requirements of the first paragraph of this point, in the buildings referred to in the preceding paragraph and in buildings where horizontal evacuation is required, at least 3 hours of backup power supply for safety lighting shall be provided.

(7) In buildings with different purposes, the requirements set out in the previous paragraphs of this point shall be respected for all parts of buildings that are evacuated from premises that meet any of the requirements set out in the previous paragraphs of this point.

(8) Safety lighting luminaires must be installed in accordance with the SIST EN 1838 standard. Exit and escape route markings shall be illuminated directly or indirectly by security lighting. The exit markings, which according to Table 35 must be illuminated in a permanent joint, must be illuminated directly.

(9) The test elements and lamps shall be marked accordingly.

(10) The requirements for safety power supply and electrical conductors of safety systems set out in point 2 of this technical guideline must be complied with.

(12) The luminous intensity of the pictograms and the illumination of the rooms by security lighting shall comply with the standard SIST EN 1838.

(13) Unless otherwise specified in this technical guideline, safety lighting shall be designed and implemented in accordance with the standards SIST EN 1838, SIST EN 50171 and SIST EN 50172. Lamps shall comply with the standard SIST EN 60598-2-22.

(14) If safety lighting requires 3 hours of operation and the luminaires are powered by local batteries incorporated in the luminaires, the capacity of local batteries may be reduced to 1 hour if the luminaires of normal lighting and safety luminaires are connected to an aggregate capable of providing a power supply of at least 3 hours at full load.

(15) If the spaces are not permanently occupied and are sufficiently illuminated by daylight and cannot be dimmed during daylight hours, the illuminance of the pictograms in a permanent junction may be switched on by the inclusion of general lighting.

Table 35: Requirements for the installation of safety lighting in buildings

Destination of a building or part of a building (CC-SI)	BTP of a building or part of a building [m^2]	Number of users	Number beds	Maximum turn-on time [s]	Minimum operating time [h]	Illumination of the pictograms in a permanent joint
113 - Special purpose residential buildings 1274 - Non-residential buildings n.e.c.	1.000	200	10	1	3	not
121 - Catering buildings	1.000	100	10	1	1	Yes[2]
1262 - Museums and libraries 1263 - Education and scientific research buildings 1265 - Sports halls	1.000	100	10	1	1	Yes[3]
122 - Administrative and office buildings 1272 - Religious service buildings, cemetery buildings	1.000	200	-	15	1	not
1242 - Garage buildings with daylight	1.000	200	-	15	1	not
1242 - Garage buildings without daylight	500	-	-	1	1	Yes[4]
125 - Industrial buildings and warehouses up to 1000 MJ/m2 1271 - Non-residential agricultural buildings	2.000	200	-	15 [1]	1	not
125 - Industrial buildings and warehouses above 1000 MJ/m2	1.000	-	-	1	1	not
1261 - Culture and entertainment buildings 123 - Commercial and other buildings for service activities	500	100	-	1	1	Yes[3]
1264 - Health care buildings	500	100	10	1	3	yes

[1] In the case of a building with work processes where failure of general lighting would cause a fire hazard, the maximum turn-on time is 1 second .
[2] Applicable to buildings over 100 people.
[3] Applicable to buildings over 500 people.
[4] Applicable to public garage buildings.

3.2.3.7 Marking of escape routes and elements of active fire protection systems

(1) The installation of safety lighting pictograms shall comply with the SIST EN 1838 standard. Pictograms must meet the requirements of SIST EN ISO 7010.

(2) The evacuation pictograms shall comply with the standard SIST EN 1838 and be positioned in such a way that they are of appropriate dimensions in relation to the distances from which they must be visible. At the maximum permissible distance from the pictogram, the angle between the height of the pictogram and the plane of the escape route shall not exceed 20 degrees. The height of the installation above the exit door must be between 2 m and 2,5 m, and in the case of higher heights directly above the door.

(3) The evacuation pictograms shall be placed perpendicular to the escape route. If the installation of pictograms in a room is required, at least one pictogram shall be visible from any point in the room.

3.2.3.8 Use of the lift in a fire

(1) Lifts in buildings without full AJP protection should not be considered as evacuation routes. The use of lifts in the event of fire in buildings without AJP is not allowed. This shall be indicated by pictograms in accordance with the SIST EN 81-73 standard at all shaft doors of the entrances to the lift cab.

(2) Lifts in buildings with AJP are divided into four levels according to their use in fire:

- Level A is a lift in which, in the event of a fire alarm, the operating time of the lift is not extended;
- Level B is a lift which, in the event of a fire alarm, extends the operating time of the lift to a critical event as defined in CNGV Guideline 410;
- Level C is an evacuation elevator that can evacuate building users with an elevator. Requirements for evacuation lifts are described in CNGV Guideline 410.
- Level D is a fire hoist that can be used by firefighters or trained personnel to conduct an evacuation in the event of a fire intervention. Requirements for firefighting lifts are described in SIST EN 81-72.

(3) Notwithstanding the requirements of the first paragraph of this point, taking into account the planned fire scenarios in a building with an AJP, a lift may also be used during a fire if it is classified as level B, C or D in accordance with CNG Guideline 410.

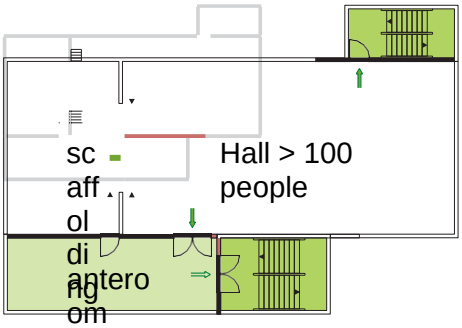
(4) For additional requirements on the use of lifts in fire, see Guideline SPZV 410.

3.3 ADDITIONAL REQUIREMENTS FOR SIZE USER BUILDINGS

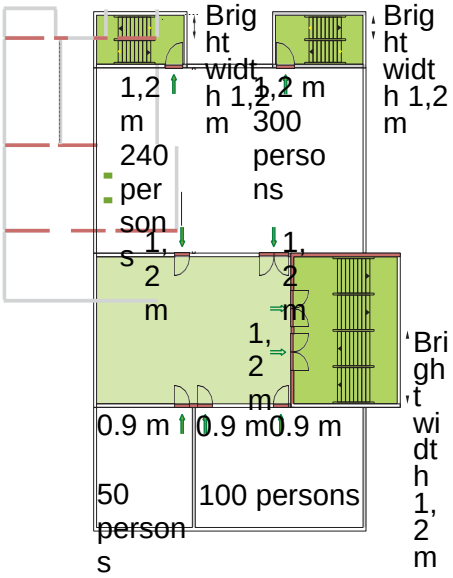
(1) If there is space for many users on the floor or basement floor, the building, regardless of the BTP floors, must have at least two independent protected staircases (see drawing 54).

(2) Exits from the premises for a large number of users shall meet the following requirements (see drawings 55 and 56):

- at least 2/3 of the required total width of the exits from the spaces must lead directly to the exit to a safe place or to a protected corridor or a protected staircase,
- 1/3 of the required total width of exits may first lead to a space used for other purposes, e.g. vestibule, lobby, waiting room, etc., provided that the required free passage width of the escape route leading to the exit to a safe place or to a protected part of the escape route is provided in such a space.



Drawing 54: Display of the design of protected staircases in the room for many users. The exit to the internally protected staircase leads through the entrance hall, which is executed as a protected corridor.



Floor

Fire-separated rooms on the first floor, an example of the calculation of the widths of evacuation exits is tied to the total number of persons on the floor for a total of 690 users:

690 persons • 0.6 m/100 persons=4.14 m Overall width of the exits:

The limits for individual rooms in terms of their maximum number must be respected:

A room with 50 persons must have at least one exit with a bright width of 0,9 m,

A room with 100 persons must have at least two exits with a bright width of 0,9 m,

A room with 540 persons must have at least three exits with a bright width of 1.2 m,

3 • 0.9 m + 3 • 1.2 m = 6.3 m

All exits shall lead to protected parts of the escape routes.

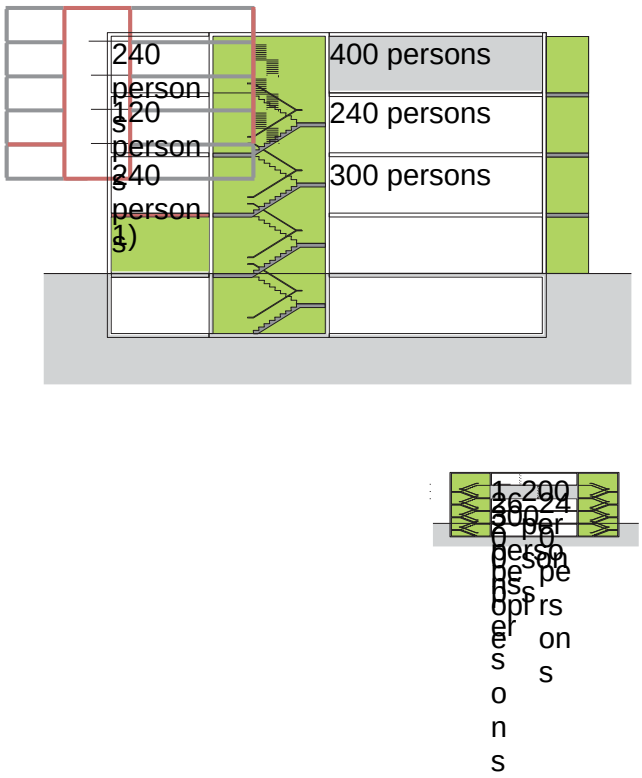
Overall ladder width:

Fire-separated rooms on the floor, an example of the calculation of the widths of evacuation exits is tied to a total of 540 users:

540 persons • 0.6 m/100 persons=3.24 m Overall width of the exits:

3 • 1.2 m = 3.6 m

Drawing 55: Determining the widths of multi-room evacuation routes for many users on one floor



The width of the escape route shall be determined taking into account all persons on the floor with the highest number of persons, i.e. 640 persons in 3. floor.

Calculation of the width of escape routes:

640 persons • 0.6 m / 100 persons = 4.032 m Examples of solutions:

a: 2 • 2.0 m = 4.0 m

b: 2 • 1.2 m + 1 • 1.6 m = 4.0 m

c: 1 • 2.5 m + 1 • 1.5 m = 4.0 m

1) At the level of the exit floor, the protected corridor must run from the protected staircase to the exit to the open air.

The width of the escape route shall be determined taking into account the movable wall of the space divided for a total of 500 users.

Calculation of the width of escape routes:

500 persons • 0.6m/100 persons=3.0m Example of solution:

We need two exits for both parts, a minimum of 2/3 must lead directly to the protected part, a maximum of 1/3 to the unprotected part, e.g. 3 • 1.2 m = 3.6 m

Drawing 56: Determination of stairway width in the case of fire-separated multi-storey collection areas

3.3.1 Seats in rows

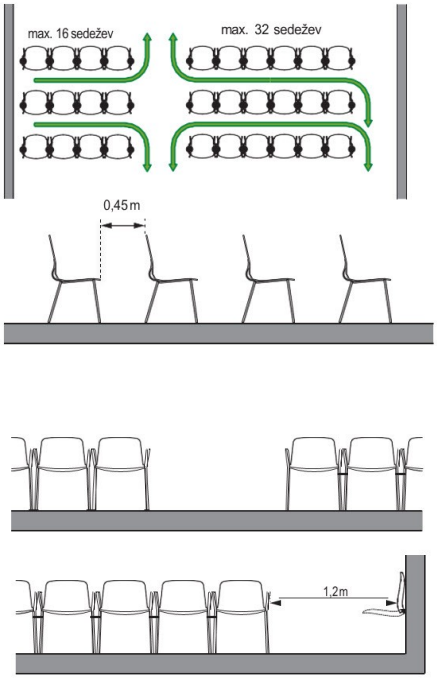
(1) Seats in rows, intermediate spaces between rows of seats and gangways between groups of rows of seats must be designed in such a way as to make the escape route as straight as possible.

(2) The distances between rows of seats are specified in the SIST EN 13200 standard. If there are no requirements in this standard for the case at hand, the requirements of Table 36 should be followed. Intermediate values may be interpolated.

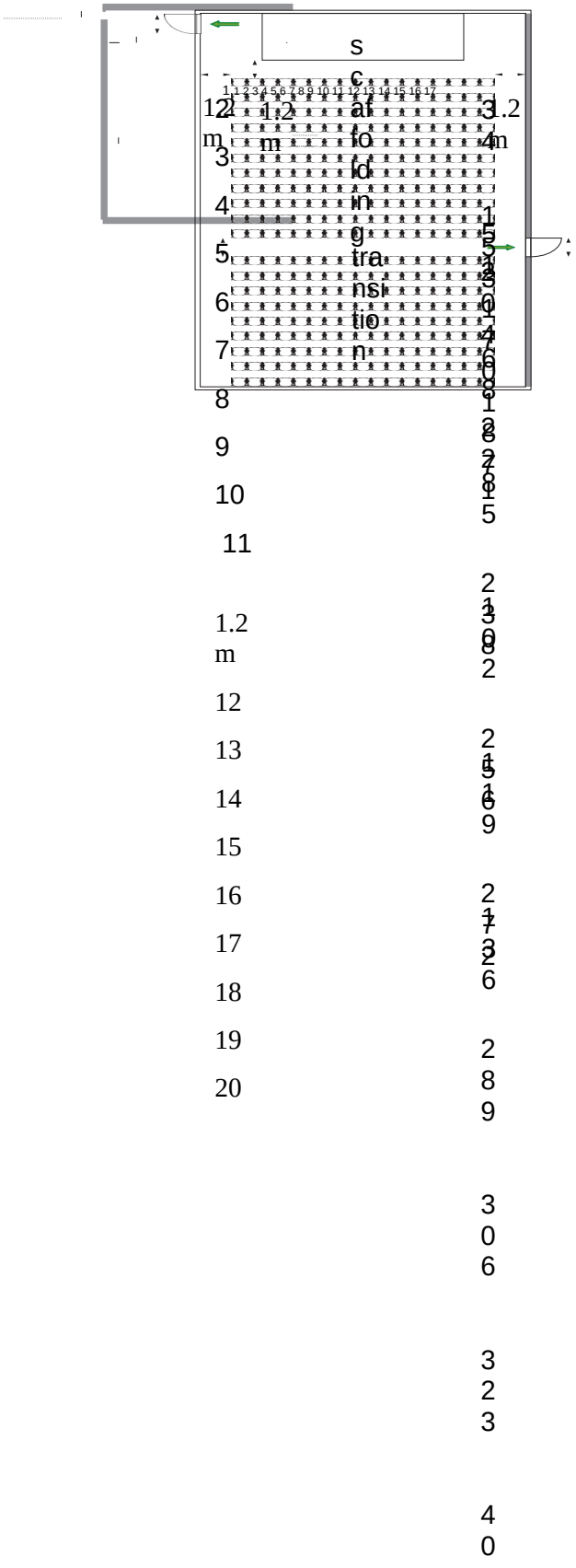
(3) The seats must be arranged in groups of no more than 30 rows, between which there must be gangways with a width of at least 1,2 m. These gangways must lead to exits from the room by the shortest possible route (see drawing 58).

(4) Seats must be fixed fixed to the floor. If this is not possible, the rows must be connected to each other in such a way that they cannot overturn and hinder the withdrawal of users (see drawing 57). These two requirements do not apply to food service areas and to parts of areas serving a large number of users where

there are no more than 20 seats.



Drawing 57: Arrangement of rows and fixing of seats in the hall



Drawing 58: Showing the arrangement of seats and exits for a concert in the gym on the ground floor

(5) In enclosed sports halls, stadiums, theatres, cinemas and similar halls with at least 100 seats, seats must meet the requirements of SIST EN 1021-1 and SIST EN 1021-2. According to SIST EN 1021-1 and SIST EN 1021-2, wooden chairs and benches are considered to be resistant to ignition by a smouldering cigarette or a match flame.

Table 36

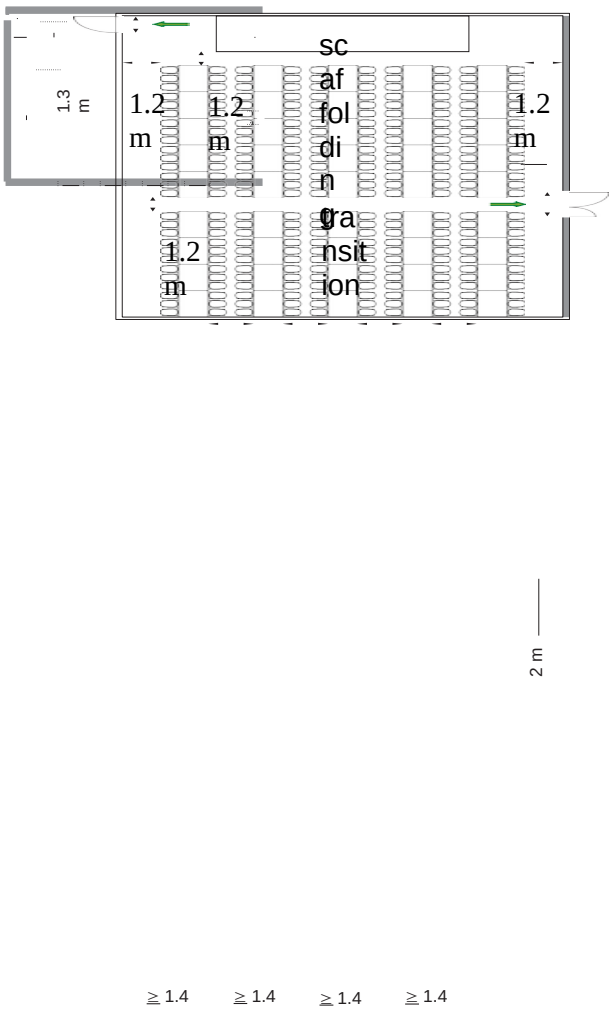
	Maximum number of seats in a row	
Minimum distance between rows:	Access from one side	Two-sided access
0,35 m	8	16
0.4 m	10	20
0,45 m or more	16	32

3.3.2 Other requirements for seats and standing areas

(1) In rooms for a large number of users, such as banquet halls, tables with associated seats must be positioned in such a way that the distance between the nearby edges is at least 1.4 m and the distance between the nearby edges of the seats is at least 0.6 m. The length of the path from any seat at the table to the passage must not exceed 15 m (see drawing 59).

(2) In rooms for a large number of users, such as ceremonial banquet halls, tables with associated seats must be placed in such a way that passageways lead directly to evacuation exits.

(4) The floor at the passageways shall be at the same level as the floor at the seating and standing positions.



Drawing 59: Showing the arrangement of seats and exits in the gym at the basement level, arranged for a festive banquet

3.4 SPECIFIC REQUIREMENTS FOR SPECIFIC SPECIAL SPECIAL SPECIFIC SPECIES AND ASSETS

3.4.1 Spaces with electricity installations

Notwithstanding the other requirements of point 3 of this technical guideline, in addition to the requirements of SIST EN 61936-1, the following requirements shall be taken into account for premises with electrical installations, such as switching and transformer stations, and premises for the production of electricity with associated electrical equipment:

- exits from spaces containing energy installations must be arranged in such a way that it is always possible to leave the spaces safely in the event of a fire. They must be arranged in such a way that the escape route within the space with high voltage devices does not exceed 20 m (the requirement does not apply to access ducts for busbars or cable ducts or cable spaces);
- The door must open in the direction of evacuation. Doors from rooms with high-voltage power devices must lead to an exit to a safe place. If they lead to protected stairways, protected vestibules must be built against them;
- spaces with transformers having an insulating liquid with a flashpoint below 300 °C must have an exit to a safe place or an exit to a protected vestibule leading to a protected staircase. Exits from fire-separated spaces with switching devices may also lead to the vestibule. Doors from other rooms shall not lead to this vestibule.

3.4.2 Combustion plant rooms

In addition to the requirements of this technical guideline, additional requirements of CNG 407 shall apply to spaces with solid fuel, fuel oil, gas, biogas, wood chips, etc.

3.4.3 Buildings with atriums or inner courtyards

In addition to the requirements of point 3 of this Technical Guideline, the requirements of CNGV 209 apply to atrial buildings.

3.4.4 Double façade buildings

For buildings with double facades, evacuation paths must be carried out behind the inner layer of the facade. Protected parts of escape routes must be fire-separated from the gap between the façade layers in accordance with the requirements set out in point 2 of this Technical Guideline. For double façade buildings, the additional requirements of CZPV 208 should be taken into account.

3.4.5 High-rack warehouses (VRS)

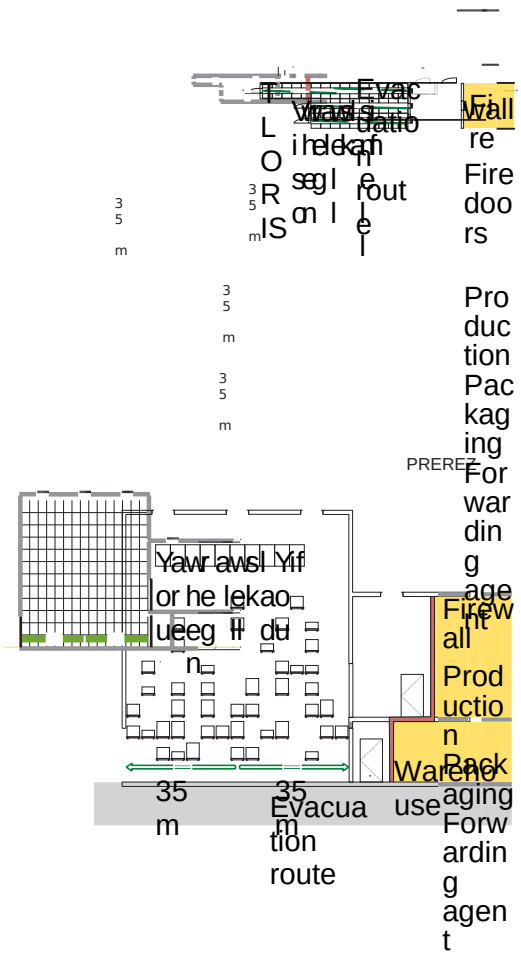
(1) For high shelving warehouses, the requirements of this point or the requirements of CNG Guidelines IZS 308 shall be taken into account.

(2) The requirements for maximum lengths of escape routes are shown in drawing 60. The following requirements shall apply to the escape route through storage racks:

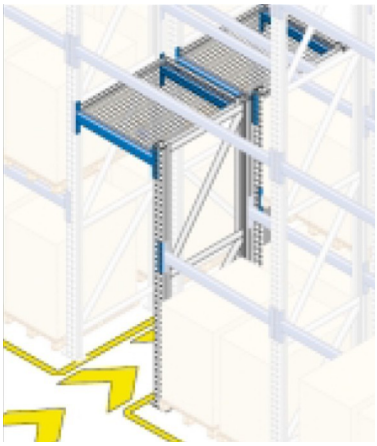
- if no more than 5 persons are present in the warehouse at the same time, the minimum width must be 0,9 m,
- the minimum height must be 2 m,
- the required width must be indicated by permanent floor markings, e.g. as shown in drawing 61.

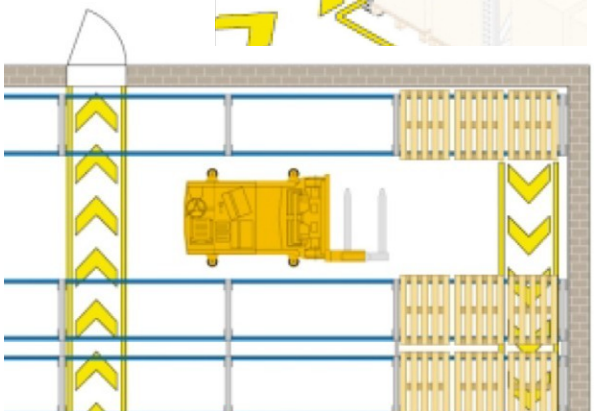
(2) If only non-combustible materials on non-combustible pallets are stored in the VRS, they can be extended up to 50 m in two directions of the length of the evacuation routes.

(3) In the case of automatic VRS, the length of the escape route may be extended up to a maximum of 70 m in two directions.



Drawing 60: Evacuation routes to the VRS





Drawing 61: Floor markings

3.4.6 Lacquers

At least two independent evacuation routes must lead from a paint shop over 100 m $^{2.}$ Exits must lead to another room, to a safe place or to another fire sector. If the exit leads to a protected staircase, a protected vestibule must be built in front of the staircase. The door must open in the direction of evacuation.

3.4.7 Laboratories, high fire risk areas, explosives depots, hazardous goods areas

(1) Doors from these spaces shall open in the direction of evacuation.

(2) If experiments are conducted in the laboratory without fire risk and with non-toxic and non-harmful chemicals, the requirements of the preceding paragraph need not be complied with.

3.5 FIRE PUBLICATION AND ALARMING SYSTEMS

3.5.1 Fixed fire alarms

(1) In addition to buildings where AJP systems are required in other points of this technical guideline, these systems must also be installed in the buildings listed in Table 37.

Table 37: Requirements for the installation of the AJP system depending on the purpose of the building

Classification of a building or part of a building	**If a building or part of a building meets any of the following conditions:**
11301 – Residential buildings with serviced housing [4] 11302 - Residential buildings for other specific social groups 12111 - Hotel and similar buildings for short-term accommodation 1212 - Other catering buildings for short-term accommodation	Buildings with floors or basements [1] in which there are 20 or more beds in total
1264 - Health care buildings	Buildings with floors or basements [1] in which there are a total of 10 or more beds or in which 100 or more patients can be accommodated at the same time
122 - Administrative and office buildings	Buildings with floors or basements [1] in which 200 or more occupants can be accommodated at the same time
12112 - pubs, restaurants and bars 123 - Commercial and other buildings for service activities 1241 – Stations, terminals, electronic communications buildings 1261 - Culture and entertainment buildings 1262 - Museums and libraries 1265 - Sports halls 1272 - Religious buildings, cemetery buildings	buildings with floors or basements [1] in which 100 or more occupants may be present at the same time, premises or buildings for auxiliary activities [2] at service stations
1242 - Garage buildings	closed garages where the floor level of the lowest floor is more than 3 m below the level of the surrounding terrain and the total number of parking spaces exceeds 200, enclosed garages with a total parking space of more than 100 m ^{2}, if they contain spaces of other design, capable of holding 50 or more occupants simultaneously, and are not separated from the garage by fire resistance class (R) EI 60 or above [3]
1263 - Education buildings and scientific research work	buildings with floors or basements [1] in which 100 or more users can be trained at the same time, buildings with floors or basements [1] in which childcare activities are carried out for 20 or more users (including those with special needs)
1274 - Other non-residential Buildings not elsewhere classified	buildings in which 20 or more protégés or convicts may be housed at the same time

Buildings with spaces for a large number of users	buildings in which rooms for many users are located on floors or basement floors [1]
Buildings with atriums	If smoke and heat extraction or control is required for the atrium (automatic extraction or smoke and heat control)

Comments:
[1] Floors from which it is not possible to directly exit all users by the prescribed dimensioned evacuation route to the level of the surrounding terrain and to a safe place are taken into account. An exit through an external protected staircase is also considered a direct exit.
[2] The premises and buildings for accompanying activities are specified in the regulations for service stations. If there are other premises with an accompanying activity in the building for the staff employed, the AJP system must be installed throughout the building in terms of complete protection.
[3] All partitions and load-bearing elements of the building must meet the requirement.
[4] The AJP system is not required within residential units.

(2) The entire AJP system must be designed and implemented in accordance with the guidelines for design, design, installation, verification, use and maintenance set out in the technical specification SIST-TS CEN/TS 54 – 14. Equipment and devices shall comply with those parts of the SIST EN 54 group of standards which relate to them. Taking into account the configuration, the compatibility and connection of system components shall be demonstrated in accordance with SIST EN 54-13. Electrically controlled systems for the automatic closing of fire or smoke doors connected to the fire control unit shall comply with the standard SIST EN 14637.

(3) Notwithstanding the previous paragraph, the AJP system may be designed and implemented on the basis of the requirements of VdS 2095 or DIN VDE 0833.

(4) In buildings where AJP systems must be installed in accordance with this technical guideline, lifts must be designed and implemented in accordance with CNGV Guideline 410 and one of the four tiers set out therein. The requirements for the AJP system shall comply with those set out in point 3.2.3.8.

(5) In double floors, which are also designed to ventilate several rooms (without ducts), smoke detectors should be installed. The smoke detector signal must switch off the ventilation system.

(8) In buildings with spaces in which more than 1,000 persons can be gathered at the same time, a fire-separate control area must be provided in an easily accessible place for fire-fighting intervention, in which all relevant fire controls, such as fire alarms, alarm systems, smoke and heat extraction, are collected. Access to this site must be from a fire-protected staircase, a protected corridor or directly from the outside.

(9) The alarm signal and the signal indicating the failure of the AJP system must be directed to a place where a person is permanently present, trained to act and the technical possibilities for alarming the competent firefighting unit are provided.

(10) The fire switchboard (possibly a parallel display) must be located in an easily and quickly accessible place near the (main) entrance to the building, which is planned as an entry point for fire-fighting intervention. In addition to the fire control unit, the fire control cabinet must contain instructions for operating the fire control unit and a plan with the positions and markings of the detectors.

(11) Where an automatic fire-extinguishing system in the sense of full protection according to point 2.9 is installed in a building, it shall replace the automatic fire alarm system. Unless required elsewhere in this Guideline, both systems must be installed in terms of total protection. In the case of complete protection with an automatic extinguishing system according to point 2.9 without an automatic smoke alarm system, a fire alarm system shall be installed at the level of manual alarms and alarms and control.

(12) In some cases, which are specifically mentioned in this technical guideline, the installation of detectors in accordance with SIST EN 14604 is allowed. Detectors shall be installed in the premises in accordance with the requirements of the standards referred to in the second paragraph of this point. In this case, such devices are not among the systems for which it is necessary to obtain a certificate of faultless operation of the APZ system.

(13) Where there is a risk of rapid development of fire, such as transport pipelines in the textile or wood industry, provision should be made for special reporting systems, such as spark detectors in pipelines. It is also necessary to provide for automatic fire alarm systems in cases where early detection of a fire is very important, because at later stages the extinguishing of such spaces is impossible. Such premises may include industrial cable shelves in ducts and shafts, conveyor belts of combustible material, etc. (protection is carried out, for example, by thermal cables).

3.5.2 Integrated alarm devices

(1) Sirens must be alarmed in accordance with SIST-TS CEN/TS 54-14, VdS 2095 or DIN VDE 0833.

(2) For buildings where voice alarming is required instead of sirens alarming (according to SIST EN 54-3) in conjunction with AJP, the requirements of point 3.5.3. shall be respected.

(3) If an AJP system is required in a building and spaces for persons with hearing or visual impairment are provided in the building, special alarm systems with lighting or vibration aids shall be installed in those spaces. Optical alarm devices shall meet the requirements of SIST EN 54-23. The requirements for optical or vibration alarming may be waived if the alarming of persons with reduced mobility is ensured by appropriate organisational measures in accordance with fire regulations.

(4) Depending on the size of the building, it can be divided into evacuation sectors, which can also be areas of simultaneous alarm.

3.5.3 Integrated voice alarm devices

(1) The voice alarm system in the second and third columns of Table 38 replaces the Sirens alarm according to the SIST EN 54-3 standard. Consideration shall also be given to the requirements of paragraph (6) in point 3.5.

(2) The voice alarm system shall be designed and implemented in accordance with the requirements of DIN VDE 0833 – 4 or SIST-TS CEN/TS 54 – 32. The equipment must meet the requirements of SIST EN 54 – 4, 54 – 16 and 54 – 24. It shall be installed in the buildings defined in Table 38.

(3) In buildings defined in the second column of Table 38, the voice alarm system shall be designed in accordance with the requirements of security level 1. In buildings defined in the third column of Table 38, the voice alarm system shall be designed in accordance with the requirements of security level 2 or 3. The safety levels and thus the method of design of voice alarm are defined in SIST-TS CEN/TS 54 – 32 and DIN VDE 0833-4.

(4) Security level I.: In the event of a transmission path fault (interruption, short-circuit or failure of the same effect), only the transmission of emergency messages may fail in one voice alarm zone. This security level allows the transmission of an emergency message within the fire sector to fail in the event of a transmission path failure. In practice, this means that a sound transmission path must be installed for each fire sector and that appropriate measures must be taken to ensure that the failure of one transmission path does not affect the other transmission path (siren line).

(5) Safety level II: In the event of an amplifier or transmission path failure (open circuit, short circuit or equivalent effect failure), STI speech comprehensibility shall not fall below 0.45 in each voice alarm range. In addition to the requirements for safety level I., this level requires that transmission paths are arranged in such a way that, even in the event of failure in the areas concerned, the emergency message will still be heard in a comprehensible manner. This can be achieved by a design method such as cables that are routed differently (see 7.5.6 of CEN/TS 54-32) or loudspeaker cables with a loop (see 7.5.7 of CEN/TS 54-32). Thus, for example, a malfunction of one of the two installed speaker lines is permissible.

(6) Safety level III: In the event of a failure in the entire system, speech comprehensibility according to the STI method shall not fall below 0.45 in each alarm voice range. In addition to the II. security level requirements for transmission paths, this level also requires the installation of a fully redundant VACIE including an emergency microphone.

(7) In buildings where, in addition to voice alarming, an AJP system must be installed in accordance with the requirements of this Guideline, the systems shall be connected.

(8) If a security guard or receptionist (control room) is foreseen in the building, a microphone operating unit must be installed in this room. If there is no such space in the building, it must be located in an easily and quickly accessible place near the (main) entrance to the building, which is planned as an entry point for firefighting intervention. In addition to the fire switch, the fire box must contain instructions for operating the operating unit with a microphone.

Table 38: Requirements for the installation of a voice alarm system

Destination of a building or part of a building (CC-SI)	Security level I.	Safety level II or III.
1211 - Hotel and similar buildings for short-term accommodation	Buildings with more than 100 beds	Buildings with more than 300 beds
12201 - Public administration buildings 12202 - Buildings of banks, post offices, insurance companies	buildings with a BTP of more than 5 000 m^2, which can accommodate more than 500 persons at a time	Buildings that can accommodate more than 2,000 people at the same time
12203 - Conference and congress buildings	buildings with a BTP of more than 5 000 m^2, which can accommodate more than 500 persons at a time	buildings in which there may be more than 3000 persons at the same time
12301 - Merchant buildings	buildings with a BTP of more than 5 000 m^2, which can accommodate more than 500 persons at a time	Buildings with a BTP of more than 30000 m^2
12302 - Fair halls, exhibition grounds	buildings with a BTP of more than 5 000 m^2, which can accommodate more than 500 persons at a time	Buildings that can accommodate more than 2,000 people at the same time
1241 - Station buildings, terminals, communication buildings and associated buildings	Other station buildings and terminals capable of holding more than 500 persons at the same time	buildings for international passenger air transport, Other station buildings and terminals capable of holding more than 1,000 persons at the same time
1242 - Garage buildings	closed garage buildings with a BTP of more than 5,000 m^2, in which more than 500 persons can be accommodated at the same time	nr
125 – Industrial buildings and warehouses	Buildings where more than 500 employees work at the same time	Buildings where more than 1,000 employees work at the same time
1261 - Culture and entertainment buildings	buildings with a BTP of more than 5 000 m^2, which can accommodate more than 500 persons at a time	buildings in which there may be more than 3000 persons at the same time
1262 - Museums and libraries	buildings with a BTP of more than 5 000 m^2, which can accommodate more than 500 persons at a time	nr
1263 - Education and scientific research buildings	buildings with a BTP of more than 5,000 m2 for primary and secondary education, vocational education, higher and university education, non-institutional education and scientific research work, research laboratories hosting more than 500 persons at the same time	buildings for primary and secondary education, vocational education, higher and university education, non-institutional education and scientific research, research laboratories hosting more than 2,000 people at the same time
1264 - Health care buildings	nr	buildings with day patient clinics, where more than 500 persons can be accommodated at the same time
12650 - Sports buildings	indoor sports buildings with a BTP of more than 5 000 m^2, which can accommodate more than 500 people at the same time	Indoor sports buildings, which can accommodate more than 3000 people at the same time

nr-not applicable

3.5.4 Control and supervision of APZ systems

(1) The control table specifies all controls (off or on) and must be provided with regard to fire sectors, evacuation and alarm zones.

(2) The fire reporting system shall monitor (e.g. fault condition, manual operation of the system) active fire protection systems such as smoke and heat control systems, local automatic fire-fighting systems, etc. ….

(3) The controls must be carried out in accordance with CNGV Guideline 403.

3.6 SPECIFIC REQUIREMENTS FOR SPECIAL TYPES OF ASSETS

3.6.1 Multi-apartment buildings (CC-SI 112)

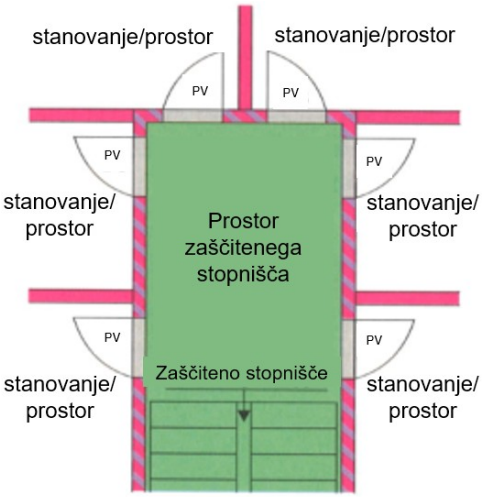
(1) Fire separation of the protected staircase from the floor corridors is not required if the following conditions are met (Figure 62):

- the BTP of each floor does not exceed 900 m^2,
- the corridor is fire-separated towards adjacent spaces by a wall having fire resistance of at least the same class as required for a protected staircase,
- the protected corridor between two adjacent protected stairways shall be separated by fire resistance of at least the same class as required for the protected stairway (see drawings 62 and 63).
- a maximum of six rooms are connected to the staircase in each floor (apartments, technical rooms, shafts or corridors; in the case of several apartments per floor, a fire separation between the corridor and the staircase is required)
- the maximum depth of the landing is three times the width of one shoulder of the staircase.
- The building is not a high-rise building.

N.B.: The requirement for a maximum depth of the landing is due to the proper sweeping in case of fire.

(2) Entrance doors to apartments are not subject to requirements regarding the direction of opening. The entrance door to the building must open in the direction of evacuation if there are more than 10 residential units in the building.

(3) Inside the apartments there are no requirements for the width or shape of staircases and requirements for the width of doors and corridors.



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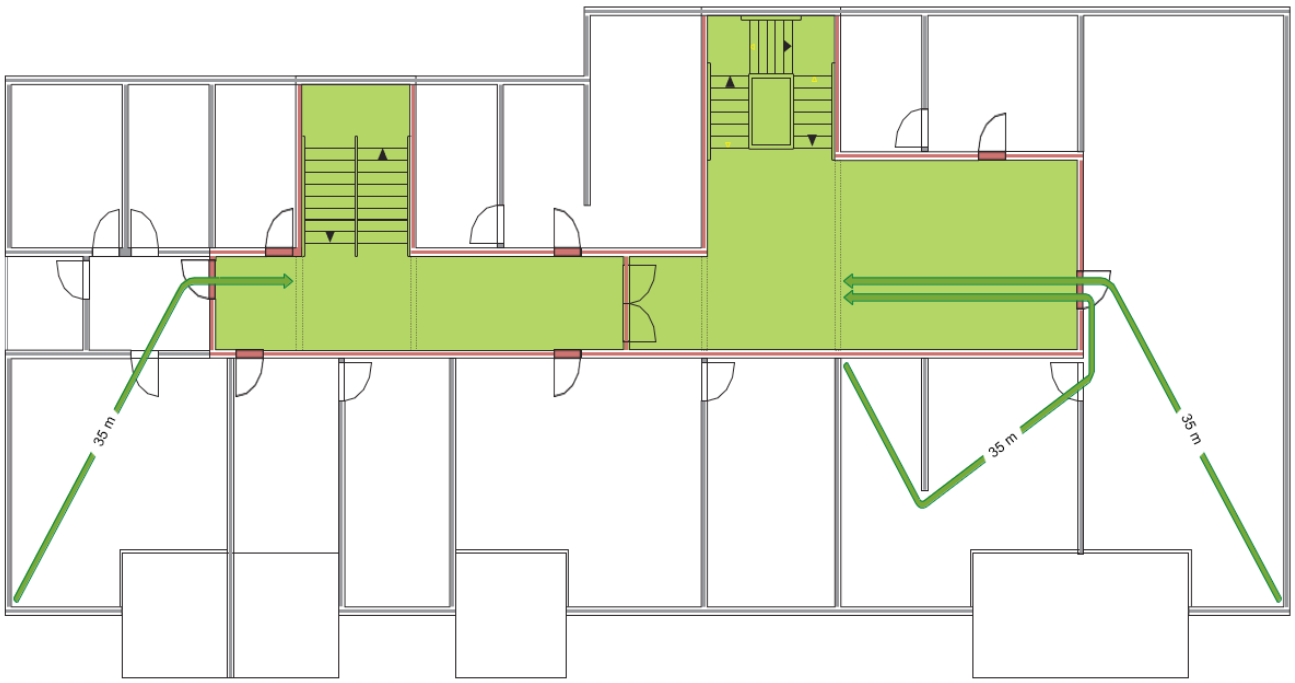
N.B.: Multi-dwelling buildings other than high-rise buildings

Drawing 62: Demonstration of an evacuation route without fire separation between a protected staircase and spaces



Drawing 63: Demonstration of the design of protected stairways and protected corridors with fire separation

3.6.2 Hotel and similar buildings for short-term accommodation (CC-SI 12111), other catering buildings for short-term accommodation (CC-SI 1212)

(1) Fire separation of the protected staircase from the floor corridors is not required if the following conditions are met (Figure 62):

- the BTP of each floor does not exceed 600 m^2,
- the corridor is fire-separated towards adjacent spaces by a wall having fire resistance of at least the same class as required for a protected staircase,
- the protected corridor between two adjacent protected stairways shall be fire-separated with a fire resistance of at least the same class as required for the protected stairway (see drawings 64).
- a maximum of four rooms are connected to the staircase in each floor (rooms, technical rooms, cleaners or corridors; in the case of several rooms per floor, a fire separation between the corridor and the staircase is required)
- the maximum depth of the landing is two times the width of one shoulder of the staircase.
- the building has a maximum of four above-ground floors

(2) Entrance doors to hotel rooms are not subject to opening direction requirements. The entrance door to the building must open in the direction of evacuation.

3.6.3 Residential buildings for other specific social groups (CC-SI 11302 and healthcare buildings (CC-SI 1264)

(1) Depending on the conditions of evacuation, we distinguish:

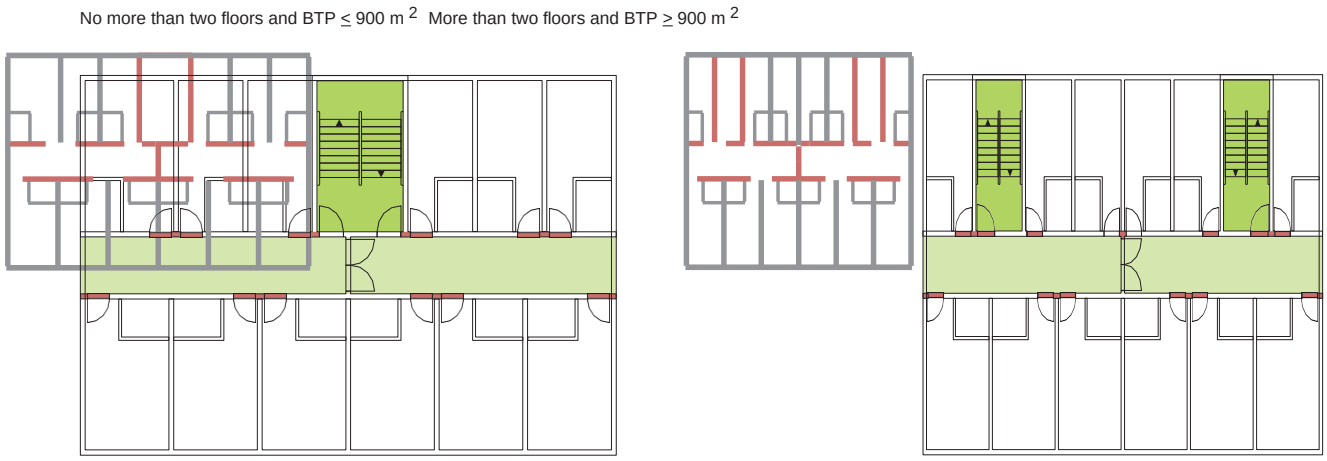
- buildings occupied or occupied by persons dependent on foreign assistance, such as reclining patients, indiscreet, poorly leaning or dementia residents and other residents with similar limitations (hospitals, homes for the elderly, social welfare institutions, etc.);
- buildings containing persons who can be evacuated independently (medical preventive outpatient services, student dormitories, boarding schools, orphanages, monasteries, refugee centres, asylum centres, etc.).

(2) In buildings occupied or occupied by persons dependent on foreign assistance, conditions for horizontal evacuation must be provided. This requirement is met if all persons from one fire sector can be evacuated to another fire sector on the same floor. The net floor area of corridors, common areas and vestibules in

fire sectors must allow for the temporary accommodation of all persons in another fire sector, taking into account the equipment installed. When determining the required surface, the dimensions of wheelchairs and sick or nursing beds on wheels shall be taken into account.

(3) Safe evacuation through a protected staircase or lift must be ensured from the fire sector in accordance with the requirements of point 3.2.3.8 of this Technical Guideline. Protected stairways must be carried out in accordance with the requirements of drawing 64.

(4) General requirements for evacuation routes shall apply in buildings for other specific social groups and in medical care buildings containing persons who can be evacuated independently without foreign assistance.



Drawing 64: Requirements for the separation of the floor into two fire sectors according to the number of staircases and BTP (see requirements in point 3.6.2 (3))

3.6.4 Garage buildings (CC-SI 1242)

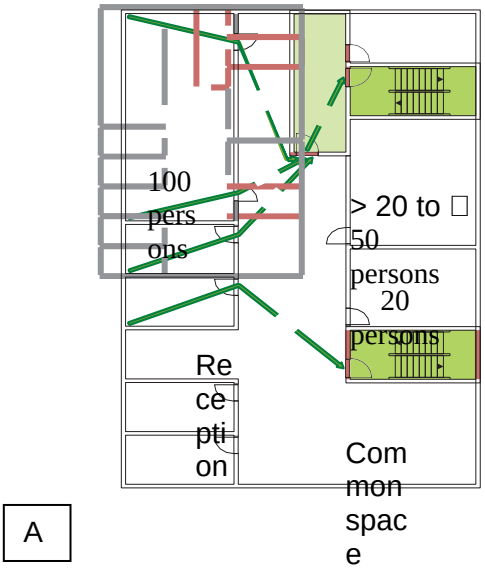
(1) If it is planned to open the gate on the escape route from the garage with a key or access control, it shall be carried out in accordance with the requirements of paragraph 3.2.3.5 (7).

(2) For additional requirements, see SZPV Guideline 311.

3.6.5 Administrative and office buildings (CC-SI 122)

(1) In buildings with up to four above-ground floors, the fire separation of the protected staircase from the corridor is not required if the corridor towards adjacent spaces is fire separated by the fire resistance required for the protected staircase and if the BTP of each floor does not exceed 600 m ^{2}.

(2) In buildings where evacuation routes lead to at least two independent protected stairways separated from the floor by the prescribed fire resistance, the corridor may be used as a reception and copying area, provided that the equipment does not reduce the minimum required clear width of the evacuation route. Wall and ceiling coverings must be non-combustible. For floor coverings, the minimum fire response class is C_{fl}-s1 (see drawing 65).



Drawing 65:
Demonstration of unprotected connections between a protected staircase and a corridor

Example: Drawing 65 shows an example of office use with common space and fire alarm installed. The common space is allowed according to the relief in this point. Evacuation route B runs from the room to the corridor (common space) to the protected staircase, the length of the evacuation route together with the common space is up to 35 m. Evacuation route A runs from the room to the corridor (common space) and to the constructionally separate corridor (independent corridor), the length of the evacuation route inside the room is up to 35 m and together with the corridor up to 50 m.

B

3.6.6 Commercial buildings (CC-SI 12301)

(1) In sales and storage rooms with a light room height of more than 7.5 m, the length of the path is measured in a straight line, but not through building elements. In other rooms, the length of the path is measured by the axis of the main and common paths. In each shop, the route leading to the exit to the safe place, to the protected part of the evacuation route or shopping street must be carried out as the main route or as a common route. The request does not have to be taken into account if any point in the store is a maximum of 10 m away from the shopping street.

(2) The main routes are those in the store which are at least 1.2 m wide and which continue into the common route or lead to the exit to a safe place, a protected part of the evacuation route or a shopping street (see drawing 66).

(3) Several main paths merge into a common path. A common path is a path that runs in a straight line to the exit to a safe place, to a protected part of the evacuation path or shopping street and is at least 1.8 m wide.

(4) Any point at the point of sale shall not be more than 10 m from the main route or the common route.

(5) In shopping malls with a shopping street, the following requirements must be observed:

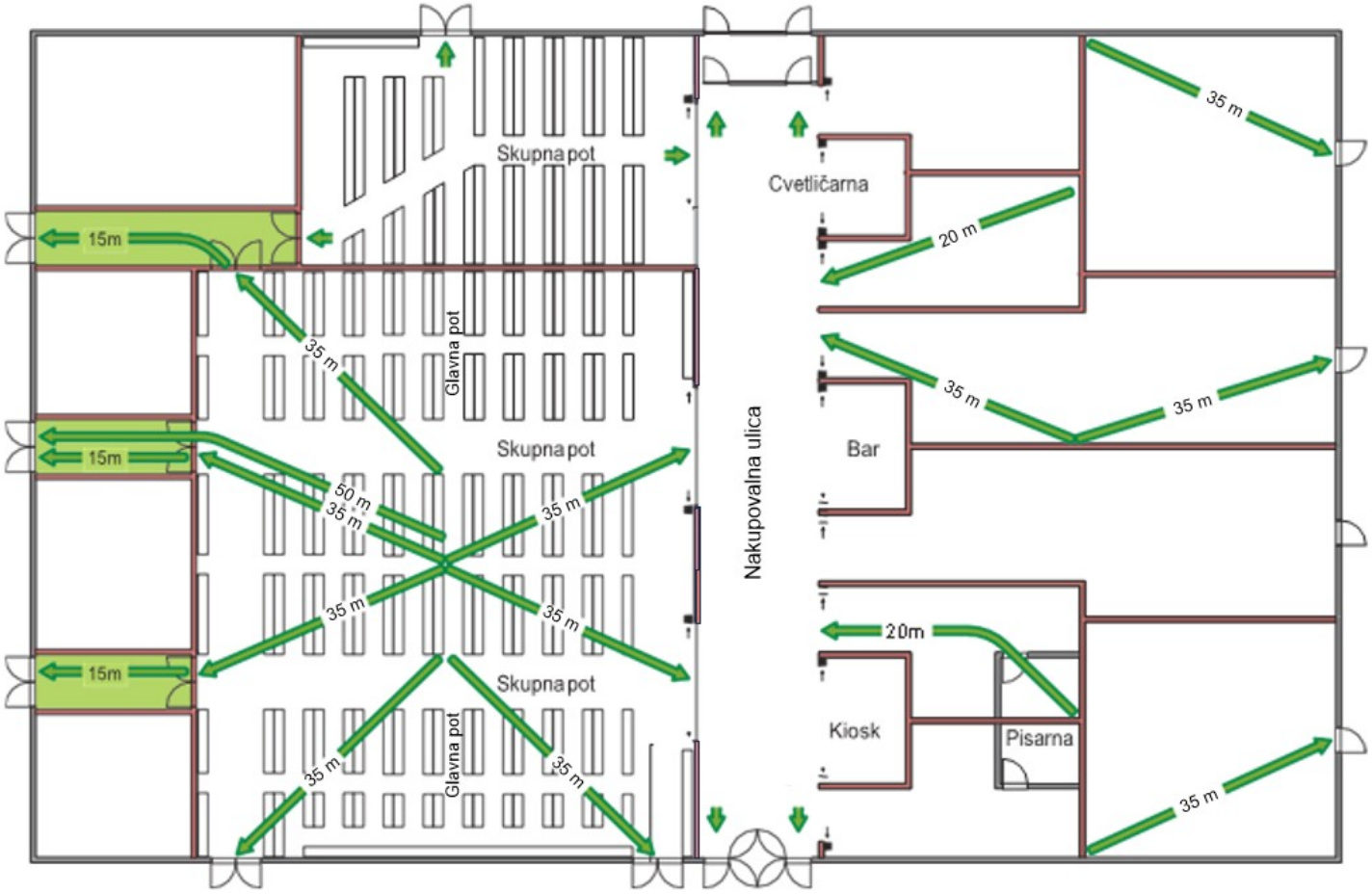
- from shops and other bars with BTP up to 200 m ^{2}, and the distance from any point of the store to the exit to the shopping street is less than 20 m, only one evacuation route is allowed,
- regardless of size, in the case of establishments with more than 50 users, two routes of evacuation must be provided
- if it is necessary to arrange at least two escape routes from shops and other bars, at least one of them must not lead to the shopping street,
- the shopping street to which evacuation routes from shops and other bars are connected must be at least 3.6 m wide,
- smoke and heat dissipation must be provided in the shopping street in accordance with point 2.8.2.4;
- at least every 50 m there must be exits to a safe place or to a protected part of the evacuation route in the shopping street.

(6) Where a toggle lock of the gangway control is fitted on the escape route, it shall comply with the

following requirements:

- switches in the direction of evacuation,
- it must be marked as an integral part of the escape route,
- the force required to open by switching to the direction of evacuation shall not exceed 100 N.

(7) An evacuation route shall not pass through the checkout passages unless an evacuation exit to a safe place or to a protected part of the evacuation route is carried out next to the waiting area in front of the checkouts or the width of the evacuation route is increased to a minimum of 1,2 m and a minimum of two shopping carts in the passage leading past the checkout.-

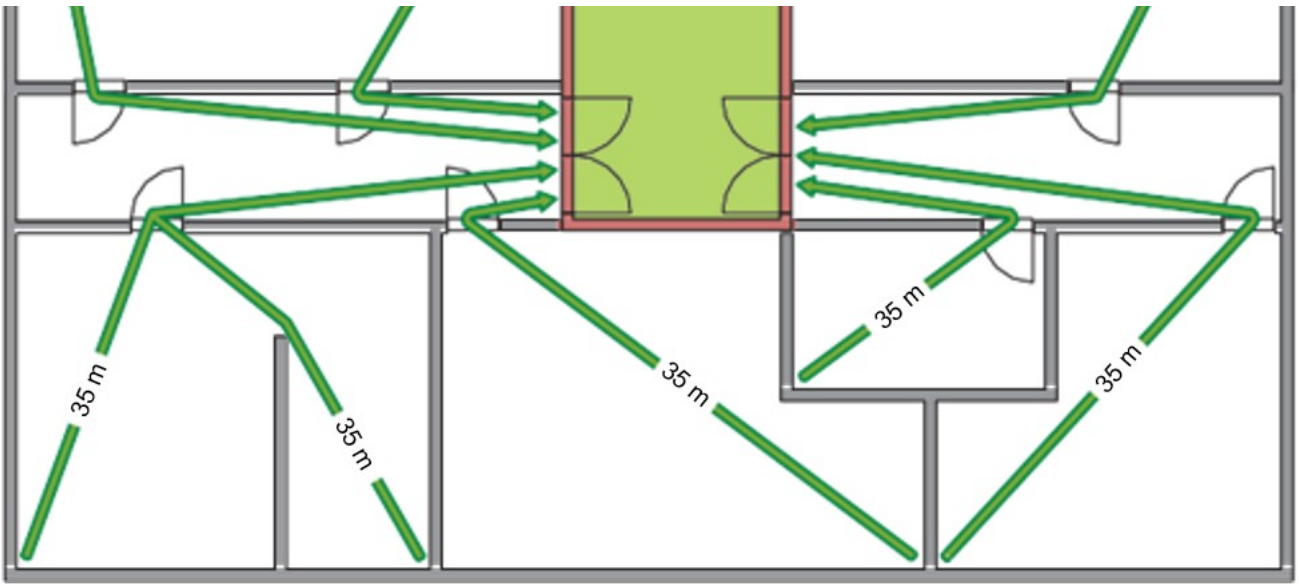


Drawing 66: Evacuation routes in commercial buildings with AJP installed in terms of full protection

3.6.7 Buildings for education and scientific research (CC-SI 1263)

(1) In buildings with up to three floors, a fire separation of the protected staircase from the corridor is not required if the corridor towards adjacent spaces is fire separated by the fire resistance required for the protected staircase and if the BTP of each floor does not exceed 900 m^2 (see drawing 67).

(2) Protected corridors referred to in the first paragraph of this point shall be subject to the same requirements as protected stairways as regards the use of materials. Appliances and equipment which may constitute a source of ignition must not be installed in corridors. The installation of open cloakrooms for pupils and fixed benches is allowed, which must not reduce the required bright width of the escape route.



Drawing 67: Demonstration of unprotected connections between the protected staircase and the hallway in the education building (below 100 users on the floor)

4. GUARANTEE DEVICES AND ACCESS OF GASILCERS

6. člen
(naprave za gašenje in dostop gasilcev)

(1) Stavbe morajo biti projektirane in grajene tako, da so glede na zasnovo, lokacijo, namembnost in velikost stavbe ob požaru:
- zagotovljene naprave in oprema za gašenje začetnih požarov, ki jih lahko uporabijo vsi uporabniki,
- zagotovljene naprave in oprema za gašenje, ki jih lahko uporabijo usposobljeni uporabniki in gasilci,
- vgrajeni ustrezni sistemi za gašenje požara.

(2) Zagotovljen mora biti neoviran in varen dostop za gašenje in reševanje v stavbi.

4.1 INTRODUCTION

(1) This point of the Technical Guidelines provides instructions for the design of fire-fighting appliances, the required quantities and method of water provision, and for an unobstructed and safe fire-fighting intervention.

(2) The public hydrant network, the appropriate distribution of hydrants, water flows and pressures in the network outside the plots on which construction is planned do not fall within the scope of building regulations on fire safety in buildings. They are regulated by the Rules on technical norms for hydrant fire-fighting networks and the Rules on testing hydrant networks.

4.2 GUARANTEE DEVICES

4.2.1 Initial fire-fighting apparatus and equipment

4.2.1.1 Internal hydrants

(1) Internal hydrants make it possible to remove fire-extinguishing water from the plumbing of a building or other source that allows internal hydrants to operate. They are intended for users of the building for extinguishing initial fires. The operating time of internal hydrants for initial extinguishing is at least half an hour, taking into account the operation of the two most unfavorable hydrants.

(2) Internal hydrants shall be installed in the buildings listed in Table 39. Table 39 does not apply to high-rise buildings.

Table 39: Requirements for the installation of internal hydrants

Building Classification (CC-SI)[6]	BTP buildings (m^2)		Size of fire sector where there is no requirement to install NH
	up to 600	600 to 2,500	More than 2,500
1122 - Multi-apartment buildings up to four above-ground floors	No requirements		Not applicable.
1122 - Multi-apartment buildings above four above-ground floors 11301 - Residential buildings with serviced housing 12111 - Hotel and similar buildings for short-term accommodation over two above-ground floors 12120 - Other catering buildings for short-term accommodation over two above-ground	No requirements	NH determined in point 4.2.1.1.(7)	Not applicable.

floors [1]			
11302 - Residential buildings for other specific social groups 122 - office and administrative buildings[2] 1241 – Stations, terminals, electronic communications buildings and associated buildings 1262 - Museums and libraries[2] 1265 - Sports buildings[2] 1272 - Religious buildings, cemetery buildings	No requirements	NH determined in point 4.2.1.1.(7)	1.000
12112 – Restaurants, restaurants and bars [1] 123 - Merchant and other buildings for service activities below 1000 MJ/m2 1261 - Culture and entertainment buildings 1263 - Education and scientific research buildings 1264 - Health care buildings[4] 1274 – Other non-residential buildings n.e.c.	No requirements	NH determined in point 4.2.1.1. (7)	1.000
123 - Merchant and other buildings for service activities above 1000 MJ/m2 1242 - Garage buildings[3] 125 - Industrial buildings and warehouses above 250 and up to 1000 MJ/m2	No requirements	NH determined in point 4.2.1.1. (8)	500
1271 - Non-residential agricultural buildings	No requirements	NH determined under point 4.2.1.1. (8)	1.000
125 - Industrial buildings and warehouses up to 250 MJ/m2	No requirements	NH determined under point 4.2.1.1. (7)	1.000
125 – Industrial buildings and warehouses above 1000 MJ/m2[5]	NH determined under point 4.2.1.1.(8)		400
-in automatic shelving warehouses and high shelving warehouses (if there are no staff in the warehouse) -in buildings or parts of buildings where a stable fire-fighting appliance is installed in accordance with point 2.9;	No requirements		Not applicable.
-Buildings where more than 300 people are staying in all rooms at the same time	NH determined under point 4.2.1.1.(7)		500

[1] In areas without a public hydrant network (e.g. rural areas, tourist farms, mountain huts, etc.), NH is mandatory in buildings with BTP buildings above 1,200 m^2

[2] Regardless of the quadrature of the BTP building or the size of the fire sector, the NH must also be installed in buildings and rooms where more than 300 people are present at the same time

[3] In open garage buildings, NH is installed in garages with more than 1,200 m^2 BTP buildings

[4] Regardless of BTP buildings, it also applies to buildings with more than 10 beds for patients

[5] Not applicable to industrial buildings and warehouses with less than 800 m^2 BTP buildings

[6] If the building also contains premises with other purposes than basic (e.g. also business premises, underground garages, etc.) and the size of the fire sectors of these premises exceeds the size indicated in the third column of this table (e.g. more than 500 m^2 large fire sector with commercial activity), an internal hydrant network must be installed.

Determination procedure: The building is classified in the CC-SI classification according to the predominant proportion of the use of all premises in the building. Based on the CC-SI and BTP classification of the building in the second column, we determine whether it is necessary to install an internal hydrant network in the building. Where an internal hydrant network is required in a building according to the second column, internal hydrants shall be installed in fire sectors exceeding the values in the third column. Example: Building with a size of 2,000 m^2 and premises with a purpose: 55% of the trade in fire loads below 1,000 MJ/m2, 30% of the garage and 15% of the warehouse, has a predominant use of 123 – commercial and other buildings for service activities below 1,000 MJ/m2. Since the BTP of the building is larger than 600 m^2 (the BTP is 2,000 m^2), an internal hydration network is required in the building.

(3) Internal hydrants may not be installed in protected stairways except in stairways constructed in accordance with the exceptions in connection with point 3.6 (the walkways and stairways are not fire-separated). Notwithstanding the requirements of Table 39, internal hydrants shall not be installed in rooms where there are substances which react dangerously with water.

(4) Internal hydrants must be arranged in such a way that it is possible to reach the entire floor area of the fire sector by means of water jets. The length of the hose and the three-metre jet range shall be taken into account.

(5) The waterproofing cabinet must be marked in accordance with SIST ISO 7010.

(6) Hydrants must be equipped with a hose of not more than 30 m in length and a suitable extinguishing handle in a hydrant cabinet. The supply pipes to the hydrants must correspond to the dimensions of the extinguishing pipes (DN 20, DN 25, DN 32 or DN 50). Supply pipes for several hydrants must be sized for the simultaneous use of two hydrants. To the valve on the hydrant, the water should always be under pressure. Supply pipes must be of non-combustible material. If they are of combustible material, the installations must be protected by materials having a fire resistance of at least K_2 30. If the pressure in the distribution network is not sufficient, a pressure increaser connected to the back-up power supply as specified in point 2.10 shall be installed.

(7) Hydrants for rooms where a small amount of water is required must be equipped with a semi-rigid fire hose with an internal diameter of at least 19 mm and a handheld. Each hydrant shall provide a flow rate of 16 l/min (0,27 l/s) at a pressure of 2,5 bar at the valve using the two most unfavourable hydrants simultaneously.

(8) Hydrants for rooms where a large amount of water is required must be equipped with a semi-rigid fire hose with an internal diameter of at least 25 mm and a handheld. Each hydrant shall provide a flow rate of 70 l/min (1,16 l/s) at a pressure of 2,5 bar at the valve using the two most unfavourable hydrants simultaneously.

(9) Instead of a wet hydrant network, a wet/dry hydrant network can also be implemented. A wet/dry hydrant network may replace a wet network only in cases where the wet/dry hydrant network is only dimensioned for initial extinguishing. The ventilation of the appliance must be sized in such a way that, in the event of use, the water is available on the internal hydrant lying in the most unfavourable position from the point of view of pressure loss, within 60 seconds at the latest. Internal hydrants according to Table 39 shall be installed at the point of abstraction of fire-extinguishing water. Calculations and dimensioning shall comply with DIN 14462-1 and DIN 14463-1.

4.2.1.2 Firefighters

The installation and use of fire extinguishers is regulated by regulations on the selection and installation of fire extinguishers.

4.2.2 Provision of fire-extinguishing water

4.2.2.1 Quantity of water required for extinguishing

(1) A quantity of water sufficient to extinguish a fire in a building for two hours and to protect neighbouring buildings must be provided. Water intended for the operation of AGS (e.g. sprinkler system) shall not be included in the extinguishing water. In the case of an AGS installed in the whole facility in terms of total protection, at least 50 % of the required water quantity according to Table 40 is required.

(2) For buildings, we determine the required amount of water for extinguishing each fire sector. Where fire sectors are separated by walls ensuring fire resistance of at least EI 60 and doors of at least $EI_2$30, the fire sector with the highest requirements shall be considered for the building as a whole. Where sectors are separated by fire resistance walls EI 30, the sum of the area of all fire sectors shall be taken into account for the building.

(3) For the calculation, we take into account the type of building, the fire load (MJ/m^2) and the area of the fire sector. The required amount of water to extinguish buildings in settlements shall be determined using Table 40 and, for buildings outside settlements, using Tables 40 and 41.

(4) At least 50 % of the water quantity (basic water quantity) specified in Table 40 must be provided within a distance of 60 m from the working surfaces of the building. The remaining amount of water should be provided at a distance of up to 300 m.

Table 40: Required amount of water for extinguishing buildings in settlements

Classification of the whole or part of a building (CC-SI)	Quantity of water in litres per minute required for one fire depending on the area (m^2) of the fire sector [1][2]					
	up to 500	1.000	2.000	5.000	10.000	Over 10,000
111 – Single-dwelling buildings[3] 112 - Multi-apartment buildings[3] 113 - Special purpose residential buildings 122 - Administrative and office buildings 1241 – Stations, terminals, communication and related buildings 1263 - Education and scientific research buildings 1264 - Health care buildings 1272 - Religious buildings, cemetery buildings 1274 - Other non-residential buildings n.e.c.	600	800	1.200	1.600	2.400	calculation: 2,400 X (Area /10,000)
121 - Catering buildings 122 - Administrative and office buildings 1241 – Stations, terminals, communication and related buildings 1261 - Culture and entertainment buildings 1262 - Museums and libraries 1265 - Sports halls 1271 - Non-residential agricultural buildings	600	1.000	1.600	2.400	3.200	3.200
125 - Industrial buildings and warehouses up to 250 MJ/m2	600	800	1.200	1.600	2.400	2.400
123 - Merchant and other buildings for service activities below 1000 MJ/m2 1242 - Garage buildings 125 - Industrial buildings and warehouses up to 1000 MJ/m2	600	1.000	1.600	2.400	3.200	calculation: 3,200 X (Area /10,000)
123 - Merchant and other buildings for service activities above 1000 MJ/m2 125 - Industrial buildings and warehouses above 1000 MJ/m2	800	1.600	2.400 [4]	3.200 [4]	4,000 [4]	calculation: 4,000 X (Area /10 000) [4]
High-rise buildings	1,600 (cell construction, fire sector < 400 m^2)	2.400	3.200	3.200	3.200	calculation: 3,200 X (Area /10,000)

[1] The second paragraph of point 4.2.2.1 shall be taken into account in the calculation of the area of the fire sector.

[2] Intermediate steps may be interpolated but shall not be less than 400 l/min.

[3] For single- and double-dwelling buildings with BTP buildings below 500 $m^{2,}$ the amount of water can be reduced to 400 l/min.

[4] Envisaged to provide firefighting water for three hours.

Example: A commercial building with a fire load of up to 1000 MJ/m^2 has a shop square of 1,200 m^2 and a warehouse square of 500 m^2. The warehouse shall be fire-separated from the EI 30 class fire resistance wall shop. For the calculation, we take into account the sum of the two sectors. 1 000 l/min is required for a commercial building of 1 000 m2 and 1 600 l/min is required for a building of 2 000 m2. Interpolation results in 1 420 l/min of water for two hours.

Table 41: Required amount of water to extinguish buildings outside settlements

Type of buildings	Required volume of water in m2 depending on the area of the largest fire sector in the building	
	Fire Department Area[2]	Amount of water [1]
Buildings outside settlements with a fire load below 1,000 MJ/m2	up to 400 m^2 401 to 1,000 m^2 1001 to 2,500 m^2	5 m^3 10 m^3 20 m^3
Buildings outside settlements with a fire load above 1,000 MJ/m2	up to 400 m^2 401 to 800 m^2	10 m^3 20 m^3

[1 Up to 5 m^3 of water brought by firefighters can be taken into account in the amount of water. The remaining water should be provided at a distance of up to 80 m from the building.

[2] If the volume of the fire sector is greater, the amount of fire-fighting water shall be provided by suitable alternative sources according to point 4.2.2.2., the amount of water shall be determined according to Table 40.

4.2.2.2 Means of providing fire-extinguishing water

(1) The following may be used for the supply of fire-fighting water:

- public or private water supply,
- natural watercourses and stagnant waters (currents, rivers, lakes, …),
- wells,
- fire-fighting water tanks.

(2) If the required amount of fire-fighting water cannot be provided by a single source, two or more sources of fire-fighting water must be provided.

(3) Each of the sources used must meet the following minimum requirements:

- a public water supply is suitable for the supply of fire-fighting water if, in addition to the regular consumption of drinking and sanitary water, it ensures a reliable supply, the necessary flow and the fire-fighting stock;
- natural watercourses and stagnant waters must have a sufficiently large permanent inflow, depth and abstraction point - a pumping station. The pumping station shall be situated sufficiently close to the water to ensure that the suction height is not higher than 5 m. At the pumping point, the water must be at least 0,4 m deep. Access to the pumping station must be provided for the firefighting vehicle in accordance with CZPV Guideline 206. If this is not possible, locations must be provided for the installation of the required number of portable motor sprinklers and for access to these locations. Water abstraction must be arranged in such a way as to allow water abstraction throughout the year in all weather conditions. If the surface of the water freezes, it should be possible to pump water from under the ice;
- a fountain with ground water is a suitable source of fire-fighting water if the water supply is such that, when pumping the required amount of water after the estimated time, the surface of the ground water does not fall deeper than 5 m. If a well of greater depths is used for fire water, it must be equipped with water-pumping devices;
- fire-fighting water tanks may be covered or discovered. For water abstraction, a shaft or built-in rigid suction hose with fire-fighting coupling, size A (Φ 110 mm) and suction cup at the bottom of the tank and a return valve with discharge is required. The depth of the tank must be such that the suction height does not exceed 5 m. The shaft or rigid suction pipe must be at least 10 m from the building. The tank must be carried out in accordance with DIN 14230. The collection points must be marked with the inscription "GASILSKI BAZEN, xx m ^{3}"(where xx represents the usable volume of fire-fighting water).
- the distance of natural watercourses and stagnant waters (currents, rivers, lakes), wells and fire-fighting water tanks from the facility may be up to 80 m in the case of provision of a basic volume of water and 300 m in the case of provision of a residual volume of water. Places of abstraction must be marked with the inscription "Place of GASIL WATER RESPECTION".

4.2.3 Fire-extinguishing appliances and equipment

4.2.3.1 Hydrants on the plot intended for construction

(1) If the public hydrant network does not ensure adequate coverage of the building by public hydrants, it is necessary to build a pipeline with hydrants on the plot intended for construction and connect it to the public water supply. This part of the water supply is subject to the same requirements as the public water supply. In doing so, all sanitary, technical and other requirements of the operator of the public water supply must be taken into account. For the operation of the hydrants on the plot, another source of water in accordance with point 4.2.2.2 may be provided to ensure the required quantity, flow, pressure and distance.

(2) Instead of a public hydrant network, an internal hydrant network with its own pool, pumping station, pipelines and hydrants can also be built.

Example: If an internal external hydrant network is carried out around the building, the amount of fire-fighting water must be recorded in the fire plan or marked hydrants with the inscription 'INTERNAL HYDRANT, CAPACITY XX m^{3} '

(3) Hydrants should, as a rule, be above ground. They must be permanently accessible. Their location must be indicated by plates made according to the SIST 1007 standard.

(4) The distance between hydrants shall be determined in such a way that a fire in a building can be extinguished from at least one hydrant and, for fire-prone buildings, from at least two hydrants. In the case of less fire-retardant buildings, the distance between the entrance to the building and the hydrant shall not

exceed 80 m. In the case of fire-retardant buildings, the distance between the working surface and the two hydrants shall not exceed 60 m, and at the same time between the hydrants shall not be less than 40 m.

(5) The distance between the hydrant and the building and between the two hydrants should not be measured through the building. The distance between the hydrants and the building must not be less than 5 m and not more than 80 m. If the hydrants on the public pipeline meet the requirements of this paragraph, it is not necessary to install hydrants on the building plot.

Example: For a ground floor commercial building of 30 m x 70 m, the volume of the building is more than 150 m, the area of the building is 2.100 m ^{2} BTP. According to point 4.3.3.3, at least two working surfaces are required. The working surfaces may be at a maximum distance of 20 m from the intervention entrance to the building (e.g. one at the main entrance to the store and the other at the storage entrance). At a distance of up to 60 m from the working surface at the entrance, there must be at least two hydrants, that is, about 80 m from the entrance to the building. The same must be ensured for the other work surface at the storage entrance. Hydrants can be used for one or more work surfaces.

(6) The water velocity at the junction of the public hydrant network and the hydrants on the parcel must not exceed 3 m/s at the estimated water abstraction.

(7) As a rule, superfloor hydrants DN 80 or DN 100 are installed. Underground hydrants DN 80 shall only be installed in exceptional cases where the aboveground hydrant constitutes an excessive barrier (e.g. to traffic). The diameter of the water pipe to which the hydrant is connected shall not be less than DN hydrant.

(8) When taking all the required amount of water, the pressure in the water supply should not fall below 1.5 bar.

4.2.3.2 Dry lifting ducts

(1) Dry lifting ducts are vertically laid built-in fire-fighting ducts that are not connected to the plumbing. They allow firefighters to water and abstract water without the time-consuming laying of long pipelines down the staircase. Dry lifting ducts do not replace internal hydrants.

(2) Dry lifting ducts must be installed in buildings with six or more above-ground floors (see point 5 for high-rise buildings) and in buildings with more than four below-ground floors. Connections with a valve should be installed on a staircase in each floor.

(3) Connection with one or two B fire-fighting couplers for the supply of dry lifting line should be provided on the outer wall of the building, and on each floor there is a take-off connector with a valve and a fire-fighting coupler C, a blind coupler C with a 3 mm wide discharge outlet. The dry lift line shall meet the requirements of DIN 14462-2. The dry riser must be marked with the inscription "SUHI DVIŽNI WATER" at the point of charging and withdrawal.

4.2.3.3 Firewater recovery devices

(1) In commercial and service buildings (CC-SI 123), buildings for transport and communication (CC-SI 124), industrial buildings and warehouses (CC-SI 125), other non-residential buildings (CC-SI 127) and other buildings where dangerous substances are used or stored that could cause significant pollution of the environment by fire-fighting water and exceed the storage volume limits set in the IZS MST – 13, measures for the recovery of contaminated fire water must be taken into account.

(2) The measures referred to in the first paragraph shall be determined on the basis of Chapters 2 and 3 of the IZS MST — 13 Fire Water Capture Guideline.

4.3 ACCESS TO WARNING AND SOLUTION

4.3.1 Cabinet space

(1) For buildings for which a fire plan is required, space shall be provided, in addition to the main entrance to the building, for the installation of a cabinet of a size (HxWxD) of 350 mm x 300 mm x 80 mm.

4.3.2 Firefighter Elevator

(1) Firefighter lifts must be installed in buildings with more than four underground floors. It must be designed and constructed in accordance with SIST EN 81-72.

(2) Fire-fighter lifts shall be fire-separated from ordinary lifts with fire-resistance elements of at least class EI 90. If the firefighter lift is not separate, the requirements for firefighter lifts shall apply to all lifts in the same shaft. The vestibule of the lift shall be at least 2,4 m x 2,4 m in size to permit the entry of stretchers. The vestibule shall have fire-resistance class separators of at least EI 90 and doors of at least EI $_2$ 30Cx. The jack doors of the lift shall be of Class E 60 fire resistance and shall have a minimum width of 0,8 m. The machinery space shall be accessible from a protected staircase. The light floor area of the cab must be at least 2,1 m x 1,1 m. The cabin must have a minimum payload of 1,000 kg. The elevator can be opened on all floors only in fire-separated vestibules of the elevator. NKD according to SIST EN 12101-13 must be provided in the lift shaft and vestibule. Water must be pumped at the bottom of the shaft, in accordance with SIST EN 81-72. On the ground floor or the floor in which the firefighting intervention is planned to enter, the elevator entrance hall must have fire-safe access directly from the outside.

4.3.3 Surfaces for firefighters next to buildings

(1) For unhindered, safe and effective intervention in the event of fires and other accidents, firefighters' areas must be arranged next to the building. The areas for firefighters next to buildings include access routes for firefighters, access routes for fire-fighting vehicles and installation and work areas for fire-fighting vehicles.

(2) Intervention routes are access routes for firefighters and access routes for firefighting vehicles. They connect public traffic areas with the building or work and installation areas for the installation of fire-fighting vehicles and equipment next to it.

(3) Surfaces for firefighters adjacent to the building must meet the requirements set out in CNG guideline 206 Surfaces for firefighters adjacent to the building.

(4) Surfaces for firefighters adjacent to the building may also be public traffic areas (road, pavement, etc.) if they comply with the requirements of SZPV 206.

4.3.3.1 Access routes for firefighters

Access routes for firefighters must be provided to each building, namely to each entrance to the building intended for firefighting intervention.

4.3.3.2 Access route for fire-fighting vehicles

(1) The access route for fire-fighting vehicles must be provided to each working and installation area.

(2) The access route for fire-fighting vehicles in the field must be fortified and any construction underneath must be suitably load-bearing.

(3) The circular access route around the building must be arranged for the following buildings, where the built-up area of these buildings is more than 5,000 m2:
- Buildings for specific social groups (CC-SI 11302),
- healthcare buildings (CC-SI 1264),
commercial buildings (CC-SI 12301),
- industrial buildings and warehouses (CC-SI 125); and
- Buildings for education and scientific research (CC-SI 1263)

4.3.3.3 Work surfaces

(1) Work surfaces for the installation of fire-fighting vehicles, the interpretation and preparation of fire-fighting and rescue equipment must be arranged around the building in such a way that they are outside the danger zone due to the waste parts of the building, but at the same time close to the main entrances or entrances intended for intervention (e.g. at the entrance near the fire-fighting lift, at the entrances to underground garages, at the entrances to warehouses, etc.), sources of fire-fighting water (e.g. hydrants of the external hydrant network) and connections for firefighters (e.g. connection to dry or wet risers, AGS, etc.).

(2) The working area is required at each entrance to the building, through which the intervention of the firefighting unit is provided. These are, for example, entrances to staircases, ramps of underground garages, entrances to warehouses.

(3) At least one working area must be provided for each building. The distance of the working surfaces from the intervention entrance shall comply with the requirements set out in Table 42.

Table 42: Distance of work surfaces from the building

Destination or size of the building	**Distance of the working surface from the intervention entrance**
Single-family buildings (1110 according to CC-SI), two-family houses (1121 according to CC-SI)	No more than 50 m of ground clearance or 80 m of firefighters' access route, if this is not in a straight line or if there are obstacles in between.
All other types of buildings	A maximum of 20 m of ground clearance in a straight line or 40 m of firefighters' access route if this is not in a straight line or if there are obstacles in between.
All types of buildings with connection for firefighters to the internal hydrant network, AGS, etc.	A maximum of 10 m of floor distance in a straight line to the connection to the internal hydrant network, AGS or other connection for firefighters on the building, or 20 m of access routes for firefighters if this is not in a straight line or there are obstacles in between.

Example: 80 m distance is allowed in cases where the fortified fire escape route is run in an uneven line, however, the length of the fire hose is still limited to a length of 50 m (measured from the working surface to the entrance to the building).

(4) At least two working surfaces must be provided:
- for buildings for specific social groups (CC-SI 11302) and for medical care (CC-SI 1264), with more than 2,000 m^2 BTP,
- for all other buildings with more than 5,000 m^2 BTP or if the extent of the built-up area of the building is more than 150 m.

(5) Work surfaces must be provided on all sides of the building in all cases where the width and length (sides) of the building exceed 80 m.

Example 1: The layout of the working surface next to the building is associated with the necessary time of laying pipes. If the fire-fighting intervention has to lay, for example, 120 m of pipe (from the fire-fighting vehicle, along the staircase to the farthest point in the floor), it must bring and lay 8 pieces of fifteen-meter pipes, which means an extended time until the start of fire-fighting.

Example 2: The building has a size of 90 m x 60 m. One side exceeds the size of 80 m, but the other side does not exceed the size of 80 m, for the building there is no requirement to perform work surfaces on all sides.

4.3.3.4 Layout surfaces

Ladder areas are areas intended for the installation of fire-fighting vehicles equipped with ladders or a lifting platform. They must be arranged next to the building in such a way that the fire ladder or rescue basket can reach the windows, balconies or terraces through which firefighting or rescue is planned.

4.3.4. Firefighter communication systems

In second and lower-lying cellars in which persons may be held, provision must be made for the installation of a protection and rescue radio communication system enabling the communication of the firefighters' communication system. The areas in which persons may stay do not include, for example, closed parts of buildings to which access is arranged via mobile ladders or shafts.

4.3.5. Power off

(1) Depending on the size, hazard and fire load, it is necessary to install a fire switch in buildings, which allows firefighting intervention to turn off electricity in the whole building or part of the building.

(2) The fire switch shall be installed in accordance with CNG 403.

4.3.5. Additional requirements for waste collection and treatment buildings

In buildings for the collection and treatment of waste, requirements for firefighting water and firefighting areas adjacent to buildings shall be designed in accordance with CFPA Guideline E No 32.

4.3.6. Additional requirements for outdoor storage of combustible materials

In buildings where combustible materials are stored outdoors, measures may be planned in accordance with the Decree on the outdoor storage of solid combustible waste in order to meet the requirements for preventing fire transmission to neighbouring buildings, for the quantity of fire-fighting water, firefighting areas adjacent to buildings and fire-water recovery installations, despite the fact that combustible materials are not classified as waste.

5. Fire-extinguishing buildings

5.1 Introduction

(1) For fire-specific buildings or buildings with special features, the requirements of the supporting guidelines referred to in this point or in other points of this Guideline shall apply.

(2) According to this guideline, buildings exceeding one of the parameters, such as quadrature, height, number of persons, are considered to be special buildings for fire purposes. These are:

- High-rise buildings
- Collection centres
- Shops
- Industry

(3) Additional requirements are also laid down according to the specific characteristics of the buildings. Such buildings with special features are:

- Buildings with atriums
- Buildings with double facades
- Special requirements for garages
- Construction of buildings with sandwich panels
- Storage of hazardous substances
- Electrical energy storage units
- Buildings with wooden construction elements

(4) The supporting guidelines shall be applied in the manner set out in point 0 of this Guideline. If the supporting guideline does not have defined requirements for certain measures (such as building deviations from the relevant boundary, fire resistance of the structure), the requirements of guideline TSG-1-001 shall be taken into account.

(5) The requirements apply to the whole building, the building must be treated uniformly. In the case of support guideline requirements as different from TSG-1-001, the support guideline requirement shall be considered as an additional requirement or relief to the TSG guideline requirements. For parts of buildings:

- which are structurally separated; and
- have completely separate evacuation routes; and
- the risk of fire spreading from a part of the building that does not meet the requirements for specific buildings is excluded,

these parts of the building may be considered separately.

(6) If a building can be classified as one of several special buildings, more stringent requirements apply in relation to the supporting guidelines, unless otherwise stated in this guideline. The fourth and fifth paragraphs should also be taken into account.

5.2 High-rise buildings

For high-rise buildings (see definition in point 0), the requirements of CNGG 310 apply.

5.3 Collection centres

(1) In this guideline, depending on the complexity of fire protection measures, we distinguish buildings with spaces for many users and assembly areas.

(2) A building with spaces for a large number of users is also a meeting point if it exceeds any of the quantities listed in the following indents (to also take into account the fifth paragraph):

Buildings in which a large number of people gather, with rooms that individually accommodate more than 200 visitors. They shall also apply where such a facility has several premises which together accommodate more than 200 visitors, provided that those premises have common evacuation routes;

open-air buildings with scenic surfaces and stands, which are not temporary buildings and which receive a total of more than 1,000 visitors;

Buildings such as sports stadiums and outdoor sports buildings with stands that are not temporary buildings, provided they can accommodate more than 5,000 visitors.

(3) Unless otherwise indicated in the building documentation, the number of visitors within the meaning of this Guideline should be recalculated as follows:

1. for table seating: one visitor per m2 of floor area of the room,
2. for row seats and standing posts: two visitors per m^2 floor area of the room,
3. For the stands in the stands: two visitors per running metre of line,
4. for exhibition areas: one visitor per m2 of floor area of the room;

for other standing areas, at least two visitors per m2 of floor area must be taken into account. Areas to which visitors do not have access are not taken into account in the account.

(4) The facilities and requirements of IZS 307 CNG Guidelines apply to collection points.

(5) CZPV IZS 307 guideline does not apply to

1. places for religious ceremonies,
2. classrooms in general and vocational schools,
3. exhibition spaces in museums,
4. temporary facilities, e.g. tents.

(6) A building is not a meeting point if it is not also a building with spaces for many users.

Example: The industrial hall with 300 employees is not one of the premises for many users, and thus not one of the gathering places. If, in addition to the industrial hall, there is also a dining room for 300 people, this space and building is one of the rooms for many users and also a meeting point. If only 150 people can gather in the dining room, the room is one of the rooms for many people, it is not one of the buildings with meeting places, the requirements of TSG-1-001 are complied with.

5.4 Shops

For commercial buildings where the sales premises and shopping streets (excluding warehouses, technical facilities and sanitary facilities) together with the building elements of the building have more than 2000 m^2 floor area, the requirements of the CNG Guidelines IZS 304 apply.

Example: Regardless of the number of persons in the commercial parts of the buildings, the commercial parts do not belong to the assembly areas. However, if there are also halls for more than 200 people within the shopping centre, we must also take into account the requirements for meeting places.

5.5 Industry and warehouses

(1) For buildings exceeding:

- Industrial buildings with a gross floor area of more than 4000 m^2, if the fire load is less than 250 MJ/m^2
- Industrial buildings with a gross floor area of more than 2000 m^2, if the fire load is 250 MJ/m^2 and less than 1000 MJ/m^2
- Industrial buildings with a gross floor area of more than 800 m^2, if the fire load is 1000 MJ/m^2 or more
- Warehouses and covered storage areas with a gross floor area of more than ~~4~~ 800 m^2 if the fire load is up to 1000 MJ/m^2
- Warehouses and covered storage areas with a gross floor area greater than 2000 m^2, where the fire load is equal to or greater than 1000 MJ/m^2

the requirements of CNG Guidelines IZS 308 apply.

(2) An industrial building is still classified as a building with a lower fire load even in cases where local fire-separated warehouses are carried out, which do not exceed 10% of the entire building and have a maximum of 100 m^2 of storage area.

5.6 Special requirements for garages

For specificities such as smoke and heat extraction requirements, alternative fuels, in addition to the requirements of this Guideline, CNG Guideline 311 applies.

5.7 Buildings with atriums

(1) If the atrial building exceeds at least one of the following conditions:

- the height of the atrium is above 11 m; or
- the atrium extends over more than three floors, or
- the total area of all floors in the fire sector of the atrium exceeds 3 600 m^2,

In addition to the requirements of this Guideline, the additional requirements of CNG 209 should be taken into account.

5.8 Double façade buildings

If the building has a double facade, in addition to the requirements of this Guideline, the additional requirements of CNG 208 apply.

5.9 Construction of buildings with sandwich panels

If sandwich panels are used in construction, in addition to the requirements of this Guideline, the additional requirements of SZPV 415 apply.

5.10 Hazardous goods storage facilities

If hazardous substances are stored in a building, the additional requirements of CNG 210 apply in addition to the requirements of this Guideline.

5.11 Spaces with electricity storage tanks

If electricity storage tanks are installed in the building, in addition to the requirements of this Guideline, the additional requirements of CNGV 417 apply.

6 APPENDIX

ACCOUNT NUMBER OF USERS RELATING TO THE MATTER OF THE BUSINESS OF SPACE ASSESSMENT IN THEREOF

Table 5.1: Number of users per unit area (number of beds or seats or number of employees) and purpose of the building

OBJECTIVE OF THE BUILDING	Number of users/m2 / number of beds
113 - Special purpose residential buildings	
Student and student dormitories	Number of beds
Homes for the elderly	0,2
121 - Catering buildings	
Hotel buildings	Number of beds
Other catering buildings for short-term accommodation	Number of beds
Restaurants, dining rooms, buffets with drinks and food	1,0
Dance floors, discos, clubs and bars with dance music	4,0 [3]
122 - Administrative and office buildings	
Interview rooms	0,2
Reception offices	0,1
Offices	0,15
Computer rooms	0,04
Worker's wardrobes	0,2
Offices	1,0
123 - Commercial and other buildings for service activities	[1]
Ground floor	0,5
First basement and first floor	0,35
Rooms lower than the 1st basement and rooms higher than the 1st floor	0,25
Fairs, exhibition grounds	0,6 [2]
1241 - Stations, terminals and related buildings	
Airport hangars	0,02
1242 - Garage buildings	
Garage houses	Number of parking spaces, 2 persons / parking space taken into account
1251 - Industrial buildings	
Workshops	0,2
Kitchens	0,14
Production halls	Number of employees
Laboratories and Laundries	0,1
1252 - Tanks, silos and warehouses	
Warehouses and expeditions	0,03
Bulk storage facilities	0,01
1261 - Buildings for culture and entertainment	

Conference halls, banquet halls	1,0
Convention halls	2,0
Spaces for many users	2,0
Event rooms with fixed seats, e.g. cinemas, theatre halls	No of seats
Event rooms with movable, interconnected seats (see point 3.3.1)	1,5
Entertainment concert venues (without seats)	4,0
Premises for other concerts (seats)	1,3
1262 - Museums and libraries	
Galleries, exhibition spaces	0,2
Libraries	0,1
Reading rooms	0,6
1263 - Buildings for education and scientific research	
Schools	0,5
Laboratories	0,2
Learning workshops	0,15
Gyms	0,5
Kindergartens	0,3
1264 - Health care buildings	0,09
1265 - Sports halls	
Stadiums	2,0
Kegljica, billiard rooms	0,1
Ice rinks	0,5
Tribunes for spectators - standing areas	5
1274 - Other non-residential buildings	
Prisons and correctional homes	Number of beds
Other places where people gather	[2]
Waiting rooms	3,0
Premises in front of rooms for recurring events (e.g. in front of cinemas, in theatres)	4,0
Other vestibules	2,0

[1] It is necessary to take into account those premises that are intended for buyers, including shopping streets and other sales areas. Toilets with a direct exit to the retreat corridor and fire staircase are not taken into account.

[2] When spaces are multifunctional (e.g. concert rooms), the number of users may be higher. It is also necessary to take into account the rooms for the orchestra, dance; for the calculation of the number of visitors, the floor area without furniture is taken into account.

[3] Only surfaces available to visitors should be taken into account (excluding surfaces occupied by stationary equipment and furniture)