

**Fire safety of buildings
Regulations and guidelines 2002**

**Decree of the Ministry of the Environment
on fire safety of buildings**

Adopted in Helsinki, 12 March 2002

Pursuant to the Decision of the Ministry of the Environment, the following regulations and guidelines on fire safety of buildings to be applied for building works are enacted pursuant to Section 13 of the Land Use and Building Act (132/1999) adopted on 5 February 1999.

This Decree shall enter into force on 1 July 2002 and it abolishes the Decision of the Ministry of the Environment adopted on 23 May 1997 on fire safety of buildings. The former regulations and guidelines may be applied to applications for permit brought up before effectuation of this Decree.

The definition of protective covering, the fire classifications of building elements and building materials, surfaces of internal walls, ceilings and floors and the clauses 6.2.1, 7.2.3, 7.5.1, 7.6.1, 8.2.2, 8.2.3, 8.2.4, 8.2.5, 8.3.1, 8.3.2, 8.3.3, 8.3.4, 8.3.5, 9.2.2, 9.2.3 and 10.5.3 according to the former regulations may nonetheless be applied to building works, for which permit is sought before 1 January 2007. For clause 8.4 this transition period relates to the fire class of the substrate of the roof covering.

Helsinki, 12 March 2002

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Fire safety of buildings

REGULATIONS AND GUIDELINES 2002

Contents

DEFINITIONS	7.3	Fire doors, windows and shutters
Terminology	7.4	Penetrations
Fire classification	7.5	Ventilation devices
Uses of buildings	7.6	Attics, voids, external walls and balconies
1 GENERAL	8	LIMITATION OF DEVELOPMENT OF FIRE
1.1 Scope	8.1	General requirements
1.2 The essential requirement	8.2	Internal surfaces
1.3 Verification of satisfaction of the requirement	8.3	External walls
1.4 Recognition of mutual acceptance	8.4	Roof coverings
2 FIRE LOAD	9	PREVENTION OF SPREAD OF FIRE TO NEIGHBOURING BUILDINGS
2.1 Determination of the fire load	9.1	General requirements
2.2 Fire load categories	9.2	Fire walls
3 FIRE CLASSES OF BUILDINGS	10	EVACUATION IN CASE OF FIRE
3.1 Fire classes	10.1	General requirements
3.2 Restrictions on the size of buildings and on the number of occupants	10.2	Distance to exits
4 PREVENTION OF IGNITION	10.3	Number of exits
4.1 General requirements	10.4	Dimensions of exits
5 LIMITING THE FIRE INTO THE FIRE COMPARTMENT	10.5	Fire-separation and constructions of exits
5.1 General requirements	10.6	Opening of doors and lighting and marking of exit routes
5.2 Compartment area	10.7	Calculation of evacuation time
6 MAINTAINING THE LOAD-BEARING CAPACITY OF CONSTRUCTIONS	11	ORGANISATION OF EXTINGUISHING AND RESCUE OPERATIONS
6.1 General requirements	11.1	General requirements
6.2 Design based on classification	11.2	Access to objects of extinguishing operation
6.3 Design based on fire development	11.3	Smoke detector and automatic fire alarm installation
7 PREVENTION OF SPREAD OF FIRE FROM A COMPARTMENT	11.4	Smoke extraction
7.1 General requirements	11.5	Fire-extinguishing devices
7.2 Class requirements for fire-separating building elements	11.6	Limitation signs
	11.7	Safety assessment
	ANNEX	INFORMATION FOR GUIDANCE

EXPLANATION OF SYMBOLS

Regulations, which are printed in a wide column in this big type size, are binding.

Guidelines, which are in a narrow column in a small type size, contain acceptable solutions in conformity with the regulations.

Explanations, which are in a narrow column in italics provide additional information and contain references to enactments, regulations and guidelines.

Terminology

Area of premises – abbreviated **h-m²**

Attic

The space between the uppermost floor and the roof of a building, where it is possible to move about.

A usable attic is an attic in a residential building for the storage of household goods or for drying laundry, or a space intended for the storage of necessities of a farm building or for the storage of fodder.

A void in the uppermost floor, where it is not possible to move about due to insufficient height, the shape of the space or for some other reason, is not regarded as an attic.

Automatic fire alarm installation

Installation which automatically and immediately indicates a beginning fire. An automatic fire alarm installation also warns of defects endangering its operational reliability.

Automatic fire-extinguishing system

Automatically operating system designed to extinguish fires.

Automatic smoke exhaust installation

Automatically operating installation for extraction of smoke and heat generated by a fire.

Dry rising mains

A pipe installed permanently in a building intended for the supply of extinguishing media.

Emergency lighting

Lighting which in the event of failure of the normal lighting is designed to provide the lighting required for life safety.

Evacuation area

A unitary and functional part of a building in relation to the arrangements for evacuation. An evacuation area is often also a fire compartment.

Exit

A door leading directly out from an evacuation area, or a space in the building or outside of it, through which safe evacuation to the ground level or to some other safe place is possible in case of fire.

Exit enclosure

A fire-separated space between two fire compartments. An exit enclosure has two doors, which open separately into each adjoining fire compartment

without a need to open the doors at the same time.

Exit lighting

Lighting, which indicates exit routes. Exit lighting operates simultaneously with the normal lighting but independently of it.

Extinguishing route

A passageway for firefighters, which leads from the outside to basement floors and which is separate from the exits of storeys.

Fire- and smokeproof exit

Fire-separated exit, which is accessed only through a fire-separated space on storey level and further through a balcony or other space facing the open air, in order to prevent the release of fire and combustion gases into the exit.

Fire compartment

Part of a building from which the spread of fire is prevented for a stated period of time by fire-separating building elements or by some other effective means.

Fire detector

Device, which detects a starting fire and alerts those who are present.

Fire door

Door, which meets the requirements of a prescribed fire class.

Fire escape

A route which is less passable than an exit through which it is possible to escape from a fire into safety.

Fire lane

Drive-way or other drive-access by which fire engines can get sufficiently close to the building and water supply facilities in case of fire or other emergency.

Fire load

The sum of the total heat released through the complete combustion of the materials in a room. These materials include the load-bearing, bracing, fire-separating and other building elements and furnishings.

The fire load density is expressed in the regulations in megajoules per area of premises (MJ/m²).

Fireplace

A building element or a device in a building in which solid, liquid or gaseous substances are burned.

Fireproof exit

Fire-separated exit which is accessed only through a fire-separated space on storey level.

Fire resistance time

The period of time expressed in minutes, for which a building element has been verified to meet the prescribed requirements.

Fire-separated exit

Fire-separated space through which a building can be safely evacuated.

Fire-separating building element

Building element, which separates fire compartments, meeting the requirements of a prescribed fire class.

Fire wall

A wall, which prevents the spread of fire to the other side of the wall for a stated period of time and withstands the collapse of adjoining buildings or parts of such buildings and impacts caused by the collapse.

First-aid extinguishing equipment

Equipment for use by anyone for extinguishing beginning fires. For instance a hose reel, a portable fire extinguisher and a smothering blanket.

Flashover

Rapid transition of conditions, in which the surfaces of combustible materials within an enclosure are entirely ignited.

Gross floor area – abbreviated **k-m²****Internal corridor**

A corridor in an evacuation area which leads to an exit.

Passageway

Passable route from each point of the floor area leading to an exit.

Protective covering

A covering forming the surface facing a room, which protects a construction behind it from ignition, charring and other damage for a stated period of time.

Smoke extraction

The removal of smoke and heat generated by fire from a building, automatically or by gravity.

Surface

Surface part of walls, ceilings and floors, the properties of which have an influence on the ignition and spread of fire.

Fire classification

Buildings

Buildings are divided into three fire classes: **P1**, **P2** and **P3**.

Building elements

Load-bearing and fire-separating building elements are divided into classes depending on how they resist fire.

The requirements prescribed for building elements are described using the following symbols:

R load-bearing capacity,
E integrity,
I insulation.

The fire resistance period expressed in minutes is given after the symbols **R**, **REI**, **RE**, **EI**, **E** using one of the following figures: 15, 30, 45, 60, 90, 120, 180 or 240. The notation thus obtained represents the fire class of the building element.

Explanation

The fire class of a wall may be for instance REI 60 and the class of a door in the wall EI 30 or E 30. A building element, which only meets the integrity requirement E, may cause a hazard due to thermal radiation. This must be taken into consideration by establishing a safety distance to passageways in exits and to ignitable materials.

The notation may be supplemented with the symbol:

M impact resistance in case of fire.

The conformity of a building element is verified experimentally or by applying calculation methods.

The Annex of these regulations and guidelines provides information on the test methods and the basis for classification.

Building elements shall be made of such building materials that they meet the classification criteria imposed on the element for each category of use of the building.

Building materials

Classification system

Building materials are divided into classes depending on how they influence ignition of fire, spread of fire and production of smoke.

EN standards are used as test methods and for classification. A list of standards is included in the Annex 'Information for guidance'.

Available classes, supplementary additional classifications for smoke pro-

duction and formation of droplets and their notation are given in Commission Decision 2000/147/EC.

The Annex 'Information for guidance' includes a table of building products generally considered as belonging to class **A1** and **A1_{FL}** without the need for testing or further approval. The table is based on Commission Decision 96/603/EC, amended 2000/605/EC.

Building materials excluding floorings

The classes for building materials are described using the following symbols: **A1**, **A2**, **B**, **C**, **D**, **E**, **F**.

Smoke generation and formation of droplets is expressed using the additional classification **s** and **d**. The classification of smoke production is **s1**, **s2**, **s3** and of formation of droplets **d0**, **d1**, **d2**.

Explanation

A1 Products, which will not contribute at all to the fire.

A2 Products, which will contribute in the fire to an extremely limited extent.

B Products, which will contribute in the fire to a very limited extent.

C Products, which will contribute in the fire to a limited extent.

D Products, which will contribute in the fire to an acceptable extent.

E Products for which the reaction to fire performance is acceptable.

F Products for which no reaction to fire performance is determined.

s1 The smoke production is very limited.

s2 The smoke production is limited.

s3 The smoke production does not meet the requirements of class **s1** or **s2**.

d0 No flaming droplets or particles occur.

d1 The flaming droplets or particles extinguish quickly.

d2 The formation of flaming droplets or particles does not meet the requirements of class **d0** or **d1**.

Classes A1 and F are always presented without any additional classifications. Class E without any additional classification implies that no flaming droplets are formed from the material. All other classes include also additional classifications, e.g. A2-s1, d0, B-s1, d0, D-s2, d2, E-d2.

Floorings

The classes for floorings are described using the following symbols: **A1_{FL}**, **A2_{FL}**, **B_{FL}**, **C_{FL}**, **D_{FL}**, **E_{FL}**, **F_{FL}**.

Smoke production is expressed using the additional classification **s1** or **s2**.

Explanation

A1_{FL} Products, which will not contribute at all to the fire.

A2_{FL} Products, which will contribute in the fire to an extremely limited extent.

B_{FL} Products, which will contribute in the fire to a very limited extent.

C_{FL} Products, which will contribute in the fire to a limited extent.

D_{FL} Products, which will contribute in the fire to an acceptable extent.

E_{FL} Products for which the reaction to fire performance is acceptable.

F_{FL} Products for which no reaction to fire performance is determined.

s1 The smoke production is limited.

s2 The smoke production does not meet the requirements of class **s1**.

Use of the classification system in these regulations and guidelines

Of the classification system presented above, the following classes are used **A1**, **A2-s1**, **d0**, **B-s1**, **d0**, **C-s2**, **d1**, **D-s2**, **d2**, **A2_{FL}-s1** and **D_{FL}-s1**.

The additional classifications for smoke production and formation of flaming droplets used in Finland are the same for the main classes. The requirements imposed on building materials can in practice be expressed using the main classes **A1**, **A2**, **B**, **C**, **D**, **A2_{FL}** and **D_{FL}**. The class designation of a building material must, however, always also include the additional classification.

Roof coverings

Roof coverings are divided into classes according to what extent they can be considered as being difficult to ignite and slowly fire spreading with respect to external fire exposure, and how they protect their substrate from ignition.

Available classes, their notation and the assessment criteria of the classes are given in Commission Decision 2001/671/EC.

Of the classification systems in the Decision, class **B_{ROOF}(t2)** is used in these regulations and guidelines.

The Annex 'Information for guidance' includes a table of roof coverings generally considered as belonging to class **B_{ROOF}** without the need for testing or further approval. The table is based on Commission Decision 2000/553/EC.

Buildings or their fire compartments are categorised according to their primary use. The basis for categorisation is the time of use of the premises – day use, evening use or night use – as well as how familiar the users are with the premises and by what means they are able to reach safety on their own or with the help of others in case of fire.

The examples list some of the most common uses; for a particular object the category of use of the building or the fire-compartment shall be considered according to the nature of the activity in question, based on the grounds stated above.

Dwellings

For instance

- residential apartments
- leisure apartments

Accommodation premises

Premises which are normally in use 24 hours a day and where no persons are in care or in confinement.

For instance

- hotels
- holiday homes
- residential homes

Institutions

Premises which are in use 24 hours a day and where persons are in care or in confinement.

For instance

- hospitals
- old peoples' homes
- prisons

Assembly and business premises

Premises which are generally in day or evening use and occupied by a considerable number of general public or customers.

For instance

- restaurants
- shops
- schools
- sports halls
- exhibition halls
- theatres
- churches
- libraries
- daycare premises

Office premises

Premises which are generally in daytime use and where the majority of the personnel is familiar with the premises.

For instance

- offices
- bureaus
- administrative premises

Production and storage premises

Premises with a generally regular personnel familiar with the local conditions.

For instance

- ordinary industrial premises
- premises for agricultural production
- large warehouses

The activities in production and storage premises are divided into two fire hazard classes (1, less hazardous and 2, more hazardous). Separate guidelines on production and storage premises are issued in part E2 of the National Building Code of Finland.

Production and storage premises may include rooms with fire or explosion hazard in which substances or materials apt to cause danger of fire or explosion are being produced, handled or stored in a dangerous manner or in considerable quantities. There may be rooms with fire hazard or danger of explosion also in buildings belonging to other categories of use.

Garages

Separate guidelines on garages are issued in part E4 of the National Building Code of Finland.

GENERAL

1.1 Scope

1.1.1

These regulations and guidelines concern the fire safety of new buildings.

Explanation

These regulations and guidelines are applied to alteration and renovation works of buildings as provided in Section 13 of the Land Use and Building Act.

The Ministry of the Environment has issued a guide “Rakennusten paloturvallisuus & Paloturvallisuus korjausrakentamisessa” (Fire Safety of Buildings & Fire Safety in Renovation Work) on the application of the regulations and guidelines.

1.2 The essential requirement

1.2.1

What has been specifically enacted or provided on the essential requirements for buildings and other construction works in the Land Use and Building Decree or otherwise, remains in force. With regard to fire safety this entails in particular that

- the load-bearing constructions of the works shall sustain in case of fire for the imposed minimum duration of time;
- the generation and spread of fire and smoke in the works shall be limited;
- the spread of the fire to neighbouring construction works shall be limited;
- the occupants in a construction works shall be able to leave the works or be rescued by other means;
- the safety of rescue teams in building works shall be taken into consideration.

1.3 Verification of satisfaction of the requirement

1.3.1

The fire safety requirement is deemed to be satisfied if the building is designed and executed by applying the fire classes and numerical criteria provided by these regulations and guidelines.

1.3.2

The fire safety requirement is deemed to be satisfied also if the building is designed and executed based on design fire scenarios, which shall cover conditions likely to occur in the relevant building. The satisfaction of the requirement is attested case-by-case taking into consideration the properties and use of the building.

Guideline

Methods, the suitability of which has been verified, are to be used for the design work. Testing and calculation methods in accordance with European (EN) and international (ISO) standards can be considered to meet the qualification requirements, provided that they are used within the range of validity of the relevant method.

The basis for the design, the methods applied and the obtained results shall be presented in connection with the permit procedure.

Guideline

The documentation shall include at least the following items:

- a description of the building and the fire safety systems within it,
- the assumptions made concerning the use of the building throughout its entire working life,
- the assumptions made concerning the possibilities for operation of the fire brigade,
- a justification for the fire scenarios chosen as objects of examination,
- failure analysis in a sufficient extent with justification,
- the maintenance and upkeep measures required during the use of the building,
- a description of the applied methods, including the applicability of the calculation and test methods with their limitations and the source of information and the assumptions made together with justification,
- the obtained results together with a sensitivity analyses (in order to find out, whether a small change in the assumptions will cause a significant change in the fire safety),
- the acceptance criteria and a comparison of the obtained results against them and
- specification and definition of the field of application in case both methods of verification of satisfaction of the requirement according to clauses 1.3.1 and 1.3.2 have been applied for the design work.

1.4 Recognition of mutual acceptance

1.4.1

The Annex of these regulations and guidelines provides information on available testing and classification standards. In addition to these standards, also EN or other standards being enforced in other member states of the European Economic Community may be used on a basis of mutual acceptance.

FIRE LOAD

2.1 Determination of the fire load

2.1.1

The fire load is determined primarily based on the use of a compartment. The fire load may also be determined based on a reliable estimate or by calculation. The location, rate of combustion and combustion characteristics of the fire load are also taken into consideration in calculating the fire development.

Guideline

The basis for the determination of the fire load is the main use of the premises. Compartments in a building often include fire loads, which are different from the main use. In such cases it may be necessary to determine the fire load of each compartment separately and design the adjoining constructions of the relevant fire compartment accordingly.

2.2 Fire load categories

2.2.1

The different uses of buildings are assigned into fire load categories according to the density of the fire load. The fire load categories are as follows:

over 1200 MJ/m²;

Guideline

The principles of assigning different uses of buildings into fire load categories:

- Warehouses which are separate fire compartments.

The fire load of production and storage premises is determined or assessed on a case-by-case-basis.

at least 600 MJ/m² and not more than 1200 MJ/m²;

- Certain assembly rooms and business premises, such as shops, exhibition halls and libraries;
- basement compartments of residential buildings which contain storages for personal property;
- premises for repair and servicing of motor vehicles.

less than 600 MJ/m².

- Dwellings, accommodation premises and institutions;
- some assembly rooms and business premises, such as restaurants, shops of not more than 300 h-m², offices, schools, sports halls, theatres, churches and daycare premises;
- garages.

Premises with a fire load density exceeding 600 MJ/m² may in general also be assigned into this category, provided that these premises are equipped with an automatic fire-extinguishing system.

2.2.2

The requirements concerning fire resistance of load-bearing and fire-separating building elements are based on the fire load categories set out above.

FIRE CLASSES OF BUILDINGS

3.1 Fire classes

3.1.1

The fire classes of buildings are **P1**, **P2** and **P3**.

Explanation

Load-bearing constructions in buildings of fire class P1 are assumed, as a rule, to withstand fire without collapsing. The size of the building and the number of occupants are not restricted.

The requirements concerning load-bearing constructions in buildings of fire class P2 may in a fire technical sense be inferior to those of the preceding class. A sufficient level of safety is obtained by prescribing requirements especially on the properties of surfaces of walls, ceilings and floors. In addition, the number of storeys and the number of occupants are restricted depending on the use of the building.

No special requirements concerning fire resistance are prescribed for load-bearing constructions in buildings of fire class P3. A sufficient level of safety is obtained by restricting the size of the buildings and the number of occupants depending on the use of the building.

For special reasons it is possible to deviate from this classification.

3.1.2

Different parts of a building may belong to different fire classes provided that the spread of fire is prevented by a fire wall.

Exits from the parts of a building separated by a fire wall shall be constructed as separate exits so that a possible door in the fire wall does not need to be used in case of fire.

3.2 Restrictions on the size of buildings and on the number of occupants

3.2.1

The restrictions on the size of buildings are set out in Table 3.2.1.

Larger maximum gross floor areas than the figures given in the Table may be accepted if an automatic fire alarm installation, an automatic smoke extraction installation or an automatic fire-extinguishing system is installed in the building.

TABLE 3.2.1 RESTRICTIONS ON THE SIZE OF A BUILDING

Characteristic of the building	Fire class of the building		
	P1	P2	P3
NUMBER OF STOREYS			
– in general	no restriction	maximum 2	maximum 2
– residential building, office premises	no restriction	maximum 4	maximum 2
– production or storage premises, garages	no restriction	maximum 2	maximum 1
HEIGHT			
– in general	no restriction	maximum 9 m	maximum 9 m
– residential building, office premises	no restriction	maximum 14 m	maximum 9 m
– 1-storey production or storage premises	no restriction	no restriction	maximum 14 m
GROSS FLOOR AREA			
In general			
– 1-storey	no restriction	no restriction	max 2400 m ²
– 2-storey	no restriction	no restriction	max 1600 m ²
Gross floor area in production and storage premises and garages			
– 1-storey	no restriction	no restriction	no restriction
– 2-storey	no restriction	no restriction	<i>not permitted</i>
Explanation	<i>The height of a building is the distance of the intersectional point of the surface of the façade and the roof from ground level (Land Use and Building Decree, Section 58). Where necessary, the mean height of the corner points of the building shall be calculated.</i>		

3.2.2

The restrictions on the number of occupants in buildings of not more than two storeys are set out in Table 3.2.2.

TABLE 3.2.2 MAXIMUM NUMBER OF OCCUPANTS IN A BUILDING

Use of the building	Number of storeys	Fire class of the building		
		P1	P2	P3
Residential buildings		no restriction	no restriction	no restriction
Accommodation premises	1	no restriction	150 places	50 places
	2	no restriction	50 places	10 places
Institutions	1	no restriction	100 places	10 places
	2	no restriction	25 places	<i>not permitted</i>
Assembly and business premises	1	no restriction	no restriction	500 occupants
	2	no restriction	250 occupants	50 occupants
Office premises	1	no restriction	no restriction	no restriction
	2	no restriction	no restriction	150 employees
Production and storage premises	1	no restriction	no restriction	no restriction
	2	no restriction	50 employees	<i>not permitted</i>
Guideline	When it is permissible to construct buildings of more than two storeys according to Table 3.2.1, no restrictions regarding the number of occupants apply.			
	The restrictions on the number of occupants of 2-storey buildings relate to cases where the premises of the stated use are entirely or partly located on the second storey of the building. If such rooms exist on the first storey only, the restrictions on a 1-storey building may be applied.			
	If the building comprises rooms of different categories of use, the safety level of the building is assessed by considering the building as an entity.			

PREVENTION OF IGNITION

4.1 General requirements

4.1.1

Buildings shall be designed, built and furnished in such a manner that the hazard of ignition of fire is as low as possible. The hazard of external ignition shall also be considered in this context.

4.1.2

Technical installations shall be built in such a manner that the hazard of ignition of fire and spread of fire and smoke within the building is not essentially increased thereby.

4.1.3

Fireplaces, chimneys and heating devices shall be located and built or installed in such a manner that their use will not create a hazard of fire or explosion.

Explanation

Guidelines on chimneys are issued in part E3 of the National Building Code of Finland, guidelines on masonry fireplaces in part E8 and guidelines on boiler rooms and fuel storages in part E9. Regulations have been issued separately on electric and heating installations.

5

LIMITING THE FIRE INTO THE FIRE COMPARTMENT

5.1 General requirements

5.1.1

Buildings shall in general be separated into fire compartments in order to limit the spread of fire and smoke, to provide safe egress, to facilitate rescue and extinguishing operations and to limit property losses.

5.1.2

The individual storeys of a building, basement storeys and the attic shall in general be set up as separate fire compartments (fire-separation by storey).

The size of a fire compartment shall be limited in such a manner that a fire starting in a compartment will not cause unreasonably vast damages to property (fire-separation by area).

Premises with essentially different uses, or with essentially different fire loads, shall be set up as separate fire compartments, if this is necessary for the protection of people or property (fire-separation by use).

Guideline

A fire compartment may comprise several storeys, however, not compartments with rooms for accommodation or for patients.

Examples of ordinary fire compartments are staircases, residential apartments, garages, boiler rooms and production premises and warehouses of production plants. Engine rooms of lifts at the attic level, sauna facilities or other similar rooms are usually each set up as individual fire compartments separated from the rest of the attic.

In residential buildings, except for buildings of class P2 with 3–4 storeys, it is permissible to locate rooms in the attic for storage of the residents' household goods and for drying laundry. In other buildings usable attics are not allowed, with the exception of agricultural production and storage buildings, in which attics may be used

unless this causes danger to persons or domestic animals. What is stated above does not apply to spaces, which are otherwise permitted at an attic level and which satisfy the requirements imposed on fire compartments.

5.1.3

Dwellings, accommodation rooms, nursing rooms or assembly rooms shall not in general be located in buildings incorporating rooms with fire or explosion hazard.

Guideline

If the incorporation is permitted for a particular reason, these rooms shall not be immediately adjacent to each other; or else it must be ensured by effective measures that this will not cause danger to the occupants. Special design is always necessitated in case of explosion hazard.

5.2 Compartment area

5.2.1

The maximum area of a fire compartment is set out in Table 5.2.1.

Use of building	Fire class of the building		
	P1	P2	P3
FLOORS			
Residential buildings	fire separation by apartments	fire separation by apartments	fire separation by apartments
Accommodation premises and institutions			
– premises for staying overnight	800 m ²	800 m ²	400 m ²
– other premises	1600 m ²	1600 m ²	400 m ²
Assembly and business premises and offices	2400 m ²	2400 m ²	400 m ²
Production and storage premises and garages	after consideration ¹⁾	after consideration ¹⁾	after consideration ¹⁾
ATTICS AND VOIDS OF THE UPPERMOST FLOOR	1600 m ²	1600 m ²	according to the compartments underneath ²⁾
BASEMENTS	800 m ²	800 m ²	400 m ²
Notes to the Table:	¹⁾ Guidelines on production and storage premises are issued in part E2 of the National Building Code of Finland and guidelines on garages in part E4.		
	²⁾ In residential buildings this may be substituted for a specific reason by fire-separation into fire compartments of not more than 200 m ² .		
Guideline	The area is calculated in the same way as the area of premises.		

5.2.2

In order to ensure evacuation or to facilitate rescue or extinguishing operations, fire compartments are in addition divided into parts:

- accommodation premises and institutions by rooms of accommodation;
- attics and voids of the uppermost floor into parts of not more than 400 m².

5.2.3

A fire compartment can be enlarged by providing the compartment with an automatic fire alarm installation, an automatic smoke extraction installation or an automatic fire-extinguishing system.

MAINTAINING THE LOAD-BEARING CAPACITY OF CONSTRUCTIONS

6.1 General requirements

6.1.1

A building and the building elements therein must not cause danger through collapse due to the effect of fire within a specified period of time after the start of fire. If necessary for the safety of persons or with regard to the extent of damage, the building shall sustain the combustion of the entire fire load and the cooling phase without collapse.

6.1.2

If a load-bearing building element is required to have a longer fire resistance time with respect to integrity E and insulation I than with respect to load-bearing capacity R, the longer fire resistance time will also be applied to the load-bearing capacity.

6.1.3

The design of load-bearing constructions may either be based on a classification, which is based on a standard temperature/time curve or on the actions of a design fire scenario.

6.2 Design based on classification

6.2.1

The class requirements for the load-bearing capacity of constructions are set out in Table 6.2.1.

Guideline

The idea behind the class requirements is that in order to guarantee the safety of persons and to limit damage, buildings of class P1 with more than two storeys will not collapse during the fire or cooling phase. Their frameworks are assumed to sustain the combustion of all combustible materials within the building or a part of it without extinguishment.

A considerable magnitude of risk of damage may require a similar non-collapsing capacity of a building of class P1 with not more than two storeys.

6.2.2

A load-bearing construction is designed to correspond with the class requirement with reference to the standard temperature/time curve. Conformity with the requirement is attested by:

- testing,
- calculation,
- combining the results of testing and calculation or
- using an acceptable design method based on use of tables.

TABLE 6.2.1

CLASS REQUIREMENTS FOR LOAD-BEARING CONSTRUCTIONS

Column	Fire class of the building				
	P1			P2	P3
	Fire load MJ/m ²				
	over 1200	600–1200	under 600		
	1	2	3	4	5
Buildings with not more than 2 storeys, in general	R 120*	R 90*	R 60*	R 30	—
– if the insulation materials in the building are not at least of class A2–s1, d0	R 120	R 90	R 60	R 30	—
– institutions, accommodation premises, basements	R 120	R 90	R 60	R 30	—
Buildings with 3-8 storeys, in general	R 180	R 120	R 60	■	■
Residential or office buildings with 3-4 storeys					
– storeys	R 180	R 120	R 60	R 60*	■
– basement storeys	R 180	R 120	R 60	R 120	■
Buildings with more than 8 storeys	R 240	R 180	R 120	■	■
Basement storeys located below the uppermost underground storey	R 240	R 180	R 120	R 120	R 60
Requirements of the uppermost floor constructions, if the insulation materials of the uppermost floor are at least of class A2–s1, d0					
– not more than 2 storeys, no attic; constructions, which are the primary part of the load-bearing framework or bracing of the building	R 60	R 60	R 60	R 30	—
– not more than 2 storeys, no attic; constructions, which are a secondary part of the load-bearing framework or bracing of the building	R 15	R 15	R 15	R 15	—
– 1 storey, no attic, automatic fire-extinguishing system; constructions, which are a secondary part of the load-bearing framework or bracing of the building	—	—	—	—	—
– 1 storey, production or storage buildings; no attic; constructions, which are a secondary part of the load-bearing framework or bracing of the building	—	—	—	—	—
The roof constructions of attics or voids, which are not the primary load-bearing constructions of the frame of the building or constructions bracing the framework in case of fire	—	—	—	—	—

Notes to the Table:

The fire resistance time requirement of balconies is half of that of the load-bearing constructions of the storey.

Derogations are permitted in production and storage buildings in accordance with the guidelines E2 of the National Building Code of Finland.

Symbols in the Table:

* = if the load-bearing constructions are not at least of class A2–s1, d0, the insulation materials of the building shall be made of materials at least of class A2–s1, d0.

○ = the load-bearing constructions shall be made of materials at least of class A2–s1, d0.

— = no class requirement

■ = not possible

6.3 Design based on fire development

6.3.1

When the design of load-bearing constructions is based on a design fire concept, a building is considered sufficiently fire safe with respect to load-bearing constructions if:

- a building of more than two storeys does not generally collapse during the fire or cooling phase or
- a building of not more than two storeys does not collapse during the period of time required for securing evacuation, rescue operations and controlling the fire.

The conditions represented by the design fire scenario are used as characteristics of the fire development in such a manner that the characteristics are liable to cover the conditions occurring in the building in question.

Explanation

The principles for the use of methods based on fire development are set out in Clause 1.3.2.

7

PREVENTION OF SPREAD OF FIRE FROM A COMPARTMENT

7.1 General requirements

7.1.1

Fire-separating building elements together with any attached installations and equipment shall be built in such a manner that the spread of fire from one fire compartment to another is prevented for a specified period of time.

7.2 Class requirements for fire-separating building elements

7.2.1

The class requirements for fire-separating and partitioning building elements are set out in Table 7.2.1.

TABLE 7.2.1 CLASS REQUIREMENTS FOR FIRE-SEPARATING BUILDING ELEMENTS

	Fire class of the building					
	P1			P2		P3
	Fire load MJ/m ²			Number of storeys		
	over 1200	600–1200	under 600	3–4	1–2	
Column	1	2	3	4	5	6
Fire-separating building elements in storeys	EI 120	EI 90	EI 60	EI 60	EI 30	EI 30
– partitioning building elements (walls and doors of accommodation rooms)	EI 15	EI 15	EI 15	■	EI 15	EI 15
Fire-separating building elements in attics	EI 30	EI 30	EI 30	EI 30	EI 30	EI 30
– partitioning building elements	EI 15	EI 15	EI 15	EI 15	EI 15	EI 15
Fire-separating building elements in basements	EI 120	EI 90	EI 60	EI 120	EI 60	EI 30

Note to the Table:

Class requirements for fire-separating building elements implementing fire-separation by area of production and storage buildings according to guidelines E2 of the National Building Code of Finland, those of garages according to guidelines E4 and the class requirements of fire-separating building elements of boiler rooms and fuel storages according to guidelines E9.

Symbol in the Table:

■ = not possible

7.2.2

A construction which fully or to some parts meets the requirements only with respect to integrity E, may be approved as a fire-separating building element. A prerequisite for this is that evacuation of people is not endangered and that a fire does not spread to another fire compartment during the required fire resistance period. If the area of the part meeting only the integrity requirement is more than 0,1 m², an appropriate safety distance to passageways in exits and to ignitable materials is required.

Guideline

A fire-separating building element meeting the requirements only with respect to integrity E may cause hazard due to thermal radiation. The thermal radiation is measured in tests. The necessary safety distance is calculated based on the results of the measurements.

For constructions with a relatively small area, which penetrate thermal radiation, the safety distance is determined so that the heat flux at this distance does not exceed 10 kW/m².

For constructions with an area of less than 2 m², which penetrate thermal radiation, the safety distance to passageways in exits and to ignitable materials is 1,5 m.

7.2.3

For building materials used in fire-separating building elements the class requirement A2-s1, d0 is imposed

- for fire-separating walls in exits in buildings of class P1 with more than two storeys and
- for fire-separation of basement spaces, with the exception of basements of buildings of class P3 belonging to only one apartment.

7.3 Fire doors, windows and shutters

7.3.1

The fire resistance time of a door, window and other building element covering relatively small openings in a fire-separating building element shall in general be at least half of the fire resistance time required for the fire-separating element.

Guideline

The class designation of a fire door is EI or E together with the fire resistance time in minutes. For doors of class E, the safety distance is to be determined in accordance with clause 7.2.2.

7.3.2

A fire door shall in general be self-closing and self-bolting. If the door is kept open in normal use, it shall be equipped with devices, which will close the door in case of fire.

Guideline

Closing devices are not necessary in fire doors at storey-level of residential apartments.

7.3.3

Partitioning doors in accommodation premises shall be equipped with closing devices.

7.4 Penetrations

7.4.1

Necessary pipes, shafts, ducts, cables and flues and penetrations required by conveyors may be mounted through fire-separating building element, provided that the fire-separating capacity of the building element is not essentially reduced.

7.5 Ventilation devices

7.5.1

Ventilation devices shall be made in such a way that they will not increase the hazard of spreading fire or smoke gases.

The walls of ventilation ducts shall in general be made of building materials of at least class A2-s1, d0. The ducts shall be easy to clean.

Explanation

The fire safety of ventilation devices is considered in guideline E7 of the National Building Code of Finland.

7.6 Attics, voids, external walls and balconies

7.6.1

Attics and voids shall be built so that the hazard of fire ignition or of spreading fire and smoke in the building is not essentially increased thereby.

Guideline

Voids are separated into parts by effective elements in order to limit the spread of fire. In designing the elements the need of ventilation of the constructions and other conditions relating to building physics shall be considered.

A building element partitioning the void of an attic and uppermost floor is extended to the roof.

The eaves void is partitioned so that a fire cannot easily circumvent it at the outside: for instance a sufficiently wide strip of material of class B-s1, d0 may be used.

In a building of class P2 with 3–4 storeys, protruding eaves shall be made tight. If ventilation of the attic or the uppermost floor through the eaves is necessary, the ventilation gap shall be closed at the location of the partitioning element of the attic and the voids for a minimum length of one metre. The ventilation gap shall likewise be closed at the eaves above the windows and for a length of one metre outwards from the line of their frames.

7.6.2

External walls and balconies shall be constructed so that a fire will not spread via them in a hazardous manner.

Guideline

In designing the constructions of external walls, the hazard of fire spreading along the external surface of the external walls, within the construction of external walls and through the joints of external walls and the fire-separating building elements shall be considered.

In designing windows, the hazard of fire spreading from one fire compartment to another through windows of opposite or cornering external walls is considered.

Explanation

External walls are in general not fire-separating; the use of external walls as fire-separating walls is set out in Chapter 9.

LIMITATION OF DEVELOPMENT OF FIRE

8.1 General requirements

8.1.1

Building materials, which do not contribute to the development of fire in a hazardous manner, shall be used in buildings.

Guideline

The building materials must not contain substances, which burn without atmospheric oxygen. The materials to be used must neither contain substances which, through combustion generate toxic gases in an exceptional manner nor waste, which is harmful to the environment.

8.2 Internal surfaces

8.2.1

When assessing the fire-technical characteristics of walls, ceilings and floors, the contribution of the materials to the fire, the time to flashover, the release of heat and the production of smoke and flaming droplets is considered.

8.2.2

The class requirements for internal surfaces are set out in Table 8.2.2.

Guideline

Surfaces may be coated with ordinary layers of filler, putty and paint or wallpaper.

The requirements in the Table are also applied to surfaces of pipes, ventilation ducts or the surfaces of their insulation materials, unless their quantity is small.

The class requirements do not apply to building elements with a small area, such as ordinary doors, windows, attachment surfaces, handrails, skirtings, and joints between boards. The requirements do neither apply to beams and columns of at least class R 30, which are at least of class D-s2, d2.

8.2.3

Internal wall and ceiling surfaces in buildings of class P2 shall be provided with a protective covering made of building materials of class A2-s1, d0 if the construction is made of materials of class C-s2, d1 or worse. However, the requirement does not apply to beams and columns of at least class R 30.

Guideline

The function of protective coverings is to protect the construction behind the covering from ignition, charring and other damage in the initial stage of fire for a period of 10 minutes.

8.2.4

Requirements, which are one main class lower, may be permitted for surfaces if, considering the use of the fire compartment,

- the hazard of ignition or spread of fire is considerably smaller than normal or
- the provisions for evacuation are exceptionally good.

This does not, however, apply to internal corridors, exits or rooms for which the requirement is class D-s2, d2.

Guideline

When considering derogations on a case-by-case basis, the smoke production and formation of flaming droplets shall also be taken into account.

Where premises have been provided with an automatic fire-extinguishing system, less stringent requirements on surfaces may be permitted.

This does not, however, apply to buildings of class P2 with 3–4 storeys.

TABLE 8.2.2 CLASS REQUIREMENTS FOR INTERNAL SURFACES

Use of the building	Object	Fire class of the building		
		P1	P2 *	P3
Dwellings	walls and ceilings floors	D-s2, d2 ¹⁾ —	B-s1, d0 ²⁾ —	D-s2, d2 ¹⁾ —
Accommodation premises	walls and ceilings floors	D-s2, d2 —	B-s1, d0 —	D-s2, d2 —
Institutions	walls and ceilings floors	B-s1, d0 D _{FL} -s1	B-s1, d0 D _{FL} -s1	D-s2, d2 —
Assembly and business premises – fire load under 600 MJ/m ² and – area is ≤ 300 m ²	walls and ceilings floors	D-s2, d2 —	B-s1, d0 —	D-s2, d2 —
– area is over 300 m ²	walls and ceilings floors	C-s2, d1 —	B-s1, d0 —	D-s2, d2 —
– fire load ≥ 600 MJ/m ²	walls and ceilings floors	B-s1, d0 D _{FL} -s1	B-s1, d0 D _{FL} -s1	B-s1, d0 —
Office premises	walls and ceilings floors	D-s2, d2 ¹⁾ —	B-s1, d0 ²⁾ —	D-s2, d2 ¹⁾ —
Production and storage premises – fire hazard class 1	walls and ceilings floors	D-s2, d2 D _{FL} -s1	B-s1, d0 D _{FL} -s1	D-s2, d2 —
– fire hazard class 2	walls and ceilings floors	B-s1, d0 A2 _{FL} -s1	B-s1, d0 A2 _{FL} -s1	B-s1, d0 A2 _{FL} -s1
Motorcar repair shops and service stations, garages (in garages possibility of derogation according to part E4 of the National Building Code of Finland)	walls and ceilings floors	B-s1, d0 A2 _{FL} -s1	B-s1, d0 A2 _{FL} -s1	B-s1, d0 A2 _{FL} -s1
Attics and basements – usable attics	floors	A2 _{FL} -s1	D _{FL} -s1	D _{FL} -s1
– unusable attics and low attic spaces and voids	top surface of uppermost floor	B-s1, d0	B-s1, d0	—
– basements in general	walls and ceilings floors	C-s2, d1 D _{FL} -s1	B-s1, d0 D _{FL} -s1	D-s2, d2 D _{FL} -s1
– rooms for technical service	walls and ceilings floors floors of boiler room	B-s1, d0 D _{FL} -s1 A2 _{FL} -s1	B-s1, d0 D _{FL} -s1 A2 _{FL} -s1	B-s1, d0 D _{FL} -s1 A2 _{FL} -s1
Exits	walls and ceilings floors	A2-s1, d0 ³⁾ D _{FL} -s1	B-s1, d0 D _{FL} -s1	B-s1, d0 D _{FL} -s1
Internal corridors in accommodation and office premises	walls and ceilings floors	B-s1, d0 D _{FL} -s1	B-s1, d0 D _{FL} -s1	B-s1, d0 —
Saunas	walls and ceilings floors	D-s2, d2 —	D-s2, d2 —	D-s2, d2 —
Symbols in the table:	Notes to the table:			
— = no requirement	¹⁾ Minor parts of wall surfaces may be coated with building materials not meeting the requirements of any class.			
* When a protective covering according to clause 8.2.3 is required, the requirement of the surface is A2-s1, d0.	²⁾ Minor parts of wall surfaces may be coated with building materials of class D-s2, d2. This applies also to walls with a protective covering.			
	³⁾ Minor parts of wall and ceiling surfaces may be coated with building materials of class B-s1, d0			

8.3 External walls

8.3.1

Building materials used in external walls in buildings of class P1 shall be mainly of at least class B-s1, d0.

Guideline

Thermal insulation which is inferior to class B-s1, d0 shall be protected and positioned in such a manner that the spread of fire into the insulation, from one fire compartment to another and from one building to another building is prevented. In these cases rendering or a metal sheet is generally not a sufficient protection.

The framework of external walls in buildings with not more than two storeys and the framework of non-load-bearing external walls in buildings with more than two storeys may be made of building materials of class D-s2, d2. If the framework has been made of building materials of class D-s2, d2, the thermal insulation shall be made of building materials of at least class A2-s1, d0. The framework of load-bearing external walls in buildings with more than two storeys shall be made of building materials of class A2-s1, d0.

8.3.2

Requirements on building materials of external walls in buildings of class P2 with not more than two storeys are imposed only when the material is used as an internal surface of the wall, as a protective covering, as surfaces of the ventilation gap or as an external surface of the wall.

The framework of external walls of buildings of class P2 with 3-4 storeys may be made of building materials of class D-s2, d2. The insulation material and other filling material shall in this case be of at least class A2-s1, d0.

8.3.3

Requirements on building materials of external walls in buildings of class P3 are imposed only when the material is used as an internal or external surface of the wall.

8.3.4

The class requirements for external wall surfaces and the surfaces of ventilation gaps are set out in Table 8.3.4. Concerning balconies the requirements for external surfaces of external walls shall be observed.

Guideline

Surfaces may be coated with ordinary layers of filler, putty and paint.

Explanation

The requirements for internal surfaces of external walls are set out in clause 8.2.

TABLE 8.3.4 CLASS REQUIREMENTS FOR SURFACES OF EXTERNAL WALLS AND VENTILATION GAPS

	Fire class and use of the building					
	P1		P2		P3	
	Buildings of class P1 in general	Residential and office premises with not more than 4 storeys	Institutions	Residential and office premises with 3–4 storeys	Other buildings of class P2	
External surface of external wall	B-s1, d0 ¹⁾	B-s1, d0 ²⁾	B-s1, d0 ²⁾	B-s1, d0 ²⁾	D-s2, d2	D-s2, d2
External surface of ventilation gap	B-s1, d0 ¹⁾	B-s1, d0 ²⁾	B-s1, d0 ²⁾	B-s1, d0 ²⁾	D-s2, d2	D-s2, d2
Internal surface of ventilation gap	B-s1, d0	B-s1, d0	B-s1, d0	B-s1, d0	D-s2, d2	—

Symbol in the Table: — = no requirement

Notes to the Table:

¹⁾ In buildings of class P1 with not more than 8 storeys, a part of the external surface of the external walls may be of class D–s2, d2, if the constructions surrounding such parts protect the wall surface from the spread of fire. Building materials of class D–s2, d2 may be used to a small extent for the fixing of façade boards in buildings of not more than 8 storeys.

²⁾ The use of building materials of class D–s2, d2 is permitted under the provisions of Clause 8.3.5.

8.3.5

In residential or office buildings of class P1 with not more than 4 storeys, residential or office buildings of class P2 with 3–4 storeys and institutional buildings of class P2, materials of class D–s2, d2 may be used for the external surfaces of external walls and the external surfaces of ventilation gaps if

- the building is provided with an automatic extinguishing system and
- the wall is designed in a manner, which sufficiently prevents spread of fire in the wall caused by external ignition.

8.4 Roof coverings

8.4.1

Roof coverings shall be made so that a fire does not spread in the roof covering or its substrate in a hazardous manner.

8.4.2

Roof coverings shall in general be of class $B_{\text{ROOF}}(t2)$.

8.4.3

Large roof surfaces shall be broken up in parts of not more than 2400 m². The requirement does not apply to cases where the substrate of the roof covering is of at least class A2–s1, d0 or when using options according to Table 3 in the Annex ‘Information for guidance’.

8.4.4

Roof coverings not meeting the requirements of class $B_{\text{ROOF}}(t2)$ may be permitted in separate buildings without a fireplace, or in special cases also in other buildings, provided this will not cause hazard of regional fire.

Guideline

The roof surface is broken up in parts using vertical or horizontal partitioning elements. They shall as far as possible be located directly above fire-separating walls underneath.

PREVENTION OF SPREAD OF FIRE TO NEIGHBOURING BUILDINGS

9.1 General requirements

9.1.1

The spread of fire from one building to another shall not endanger life safety or cause unacceptable property losses or societal consequences.

9.1.2

The distance between buildings shall be such that fire does not spread easily to neighbouring buildings and that the hazard of regional fire remains small. If the distance between buildings is less than 8 metres, limitation of the spread of fire shall be ensured through structural or other means.

9.1.3

Roof constructions shall be such that they do not easily ignite from a fire in a neighbouring building.

9.2 Fire walls

9.2.1

If a construction work is erected adjacent to, or so close to another building that the spread of fire is evident, a fire wall shall be applied.

Guideline

Buildings located on the same plot of land or building site may in a fire-technical sense be considered as a single building, in which case ordinary fire-separation is sufficient, provided that the buildings belong to the same fire class and the entity thus formed falls below the restrictions imposed on a single building of this fire class regarding the gross floor area and number of occupants.

When an external wall is used as a fire-separating wall its unsymmetrical construction and the effects of heat radiation and possible window openings shall be considered.

9.2.2

The class requirements for fire walls are set out in Table 9.2.2.

In buildings of class P1 fire walls shall be made of building materials of class A1.

TABLE 9.2.2 CLASS REQUIREMENTS FOR FIRE WALLS

	Fire class of the building				
	P1			P2	P3
	Fire load MJ/m ²				
Column	Over 1200	600–1200	under 600		
	1	2	3	4	5
FIRE WALL	EI-M 240	EI-M 180	EI-M 120	EI-M 120	EI-M 60

Note to the Table: ○ = building material of class A1 is required

Guideline

Roof constructions and insulation materials shall be discontinuous at the fire wall. If the materials are at least of class A2-s1, d0, no partitioning is required. If the difference in height between roofs is less than 300 mm, the fire wall shall be extended above the roof by at least 300 mm. This may be replaced by adequate means, which prevent horizontal spread of fire. If the fire load exceeds 1200 MJ/m², the fire wall shall be extended above the roof by at least 750 mm, and the extension in height may in general not be replaced by other means which prevent horizontal spread of fire.

The fire wall is to be extended sideways by at least 100 mm and if the fire load exceeds 1200 MJ/m², by at least 750 mm beyond the wall line. Alternatively other partitioning structures in the direction of the wall may be used which prevent the spread of fire.

9.2.3

The fire resistance time of doors or corresponding building elements in fire walls shall be at least the same as the fire resistance time required for the fire wall. Doors in fire walls in buildings of class P1 shall be of class A2-s1, d0.

10

EVACUATION IN CASE OF FIRE

10.1 General requirements

10.1.1

It must be possible to evacuate a building safely in case of fire or other emergency. A building shall be provided with an adequate number of appropriately located exits which are sufficiently spacious and easily passable, so that the time to evacuate the building will not be so long as to cause danger.

Guideline

A lift or other similar device is not considered as an exit. It must be possible to transport persons who are immobile through an exit on a stretcher from each evacuation area.

Passageways in an evacuation area, which leads to an exit, must be sufficiently spacious and easily passable. Passageways leading to an exit may include stairs between different levels only if the levels can be considered to belong to the same evacuation area.

10.1.2

Exits shall lead outside to the ground level or to some other safe place in case of fire.

10.2.1

The distance to an exit from each point of an evacuation area is determined along the shortest passable route. If the routes to two separate exits partly join, the length of the common part is counted to twice its length.

10.2.2

The maximum permitted distance to the nearest exit is set out in Table 10.2.2.

TABLE 10.2.2 MAXIMUM LENGTH OF PASSAGEWAYS TO EXIT

Use	Length of passageway (m)
Dwellings	
– one exit	30
– several exits	45
Accommodation premises	30
Institutions	30
Assembly and business premises	
– in general	45
– shops	30
Office premises	
– in general	45
– only one exit	30
Production and storage premises and garages	
– in general	45
– only one exit	30

10.3 Number of exits

10.3.1

Each evacuation area of a building where people are staying or working otherwise than temporarily shall in general be provided with at least two separate and appropriately located exits.

10.3.2

One exit is allowed in buildings of not more than 8 storeys, if the category of use of the evacuation area is dwelling, office premises of less than 300 h-m² or production or storage space of less than 300 h-m². In these cases the evacuation area must additionally be provided with a fire escape through which it is possible for the evacuees to reach safety on their own means or by the aid of the fire department.

Guideline

If a passable route is not known beforehand, the distance is determined along a route following the direction of the walls.

For office or accommodation rooms, classrooms in schools or similar rather small rooms with access to an exit through an internal corridor, the distance to the exit is measured from the door of the room to the door of the exit.

Guideline

The distances in Table 10.2.2 may be exceeded, if

- evacuation in case of emergency is possible on a ground-level floor through windows, which can be opened or
- the building has been provided with an automatic fire extinguishing system.

Shorter maximum distances of passageways than those in the Table may be required if an exceptional risk of rapid ignition and spread of fire due to a special use of the premises endangers safe evacuation.

Guideline

When an exit is intended to be used only in case of fire or other emergencies and when the number of evacuees is small, the exit does not need to meet all prescribed requirements.

Guideline

An appropriately located balcony or a window opening through which it is possible to escape to the ground level or to some other safe place in case of fire either by rescue actions, along a fixed ladder or by using other suitable building elements, may be considered as a fire escape.

If the drop height from a balcony or a window to the ground level or some other safe place in case of fire is not more than 3,5 m, a fixed ladder is not required.

If the drop height from a balcony or a window used as a fire escape to the ground level or some other safe place in case of fire in a building of class P3 or P2 with 2 storeys is more than 3,5 m, access to safety shall always be secured with a fixed ladder.

A window, which is used as a fire escape, shall be simple to open. Its free opening is at least 600 mm in height and 500 mm in width, so that the sum of height and width is at least 1500 mm.

The fire escape arrangements shall be negotiated with the local rescue authority.

10.3.3

One exit may also be permitted in small accommodation premises and institutions and in small assembly and business premises, if this does not endanger the safety of the occupants. The evacuation areas shall in general also be provided with a fire escape.

Guideline

One exit is sufficient for instance in accommodation premises with one storey, in which the rooms are reached directly from the outside. One exit may also be considered adequate for an institution intended for not more than ten persons in care and for small cafes, kiosks and shops.

10.4 Dimensions of exits

10.4.1

The minimum width of an exit is calculated on the basis of the number of occupants evacuating through the exit. The number of occupants of an evacuation area may be distributed between different exits and the widths of the exits are added up.

The highest number of occupants intended to be present in an evacuation area shall primarily be used as the number of occupants. If several evacuation areas are connected to the same exit, the width is designed according to the evacuation area with the highest number of occupants.

Guideline

If the number of occupants is not known, or not otherwise used, it may be estimated on the basis of the area and use of the premises in accordance with Table 10.4.1.

TABLE 10.4.1
ESTIMATION OF THE NUMBER OF OCCUPANTS BASED ON THE AREA

Use of premises	Area of premises (m ² per person)
Dwellings	10
Accommodation premises	10
Institutions	10
Assembly and business premises	
– in general	3
– premises for arts and leisure and other similar assembly premises	1
Office premises	10
Production and storage premises	30

10.4.2

The width of an exit shall in general be at least 1200 mm.

In an evacuation area where the maximum number of occupants is 60, the second exit may be 900 mm in width. In residential buildings with not more than two storeys, one exit of 900 mm in width is permitted.

10.4.3

The total minimum width of the exits is 1200 mm for the first 120 occupants and the width is increased by 400 mm for each following group of 60 occupants.

The width of an internal corridor leading to an exit is calculated in the same way as the width of the exits according to the number of occupants passing along the corridor.

10.4.4

The number and width of doors leading to exits and from rooms to internal corridors shall be adequate in relation to the number of occupants using them.

10.4.5

The free height of an exit shall be at least 2100 mm.

10.5 Fire-separation and constructions of exits

10.5.1

An exit is in general considered as a fire compartment of its own.

10.5.2

The exits in buildings of class P1 shall be at least according to Table 10.5.2.

Guideline

When a fire compartment consists of several storeys joined together by open connections, and these storeys form evacuation areas of their own, the occupants have to evacuate from different storeys simultaneously through the same exits. In these cases the adequacy of the exits is assessed also on the basis of a calculation of the evacuation time for all evacuees.

Guideline

The width of an exit is measured horizontally and perpendicular to the direction of exit. Within the minimum width there shall be no other obstacles reducing the width than skirtings, edge beams or handrails.

If there are doors in the exit in the direction of passage, the minimum free exit width of a doorway or the total free width of the doorways located next to each other may be narrowed by the total width of the necessary frames.

Guideline

There shall not be any obstacles, such as beams, pipes or lamps below the minimum height level. At the doorways the height may be reduced as required by necessary frames and thresholds.

TABLE 10.5.2 **EXITS IN BUILDINGS OF CLASS P1**

Height above ground of the floor of the uppermost storey	Number of storeys	Exits
Maximum 24 m	Maximum 8	Fire-separated
Over 24 m	Maximum 16	Fire-proof
Over 24 m	Over 16	One fire- and smoke-proof, the others fire-proof

10.5.3

The flights of stairs and landings of an exit in buildings of class P1 with more than two storeys shall be made of building materials at least of class A2-s1, d0. The flights of stairs and landings shall meet the requirements of class R 30 when the fire load of the rooms leading to the exit is less than 600 MJ/m². The corresponding requirement is R 60, when the fire load is higher than that.

10.5.4

The flights of the stairs and landings of an exit in buildings of class P2 with 3–4 storeys as well as their load-bearing constructions shall meet the requirements of class R 60.

10.5.5

Materials, building elements or facilities which increase the fire load or which endanger life safety through their smoke production must not be placed in exits.

10.6 Opening of doors and lighting and marking of exit routes

10.6.1

Doors located in the direction of passage in an exit shall in general open in the direction of exit.

10.6.2

Doors, which are necessary for exit, shall open in the direction of exit if the number of occupants evacuating through the door exceeds 60.

Explanation

Such doors are doors with access to the outside, to an exit or to an internal corridor leading to an exit.

10.6.3

The doors of exits and of areas leading to the exits shall be easy to open in an emergency situation.

Guideline

Locks, which can be double-bolted without a key in such a way that they cannot be opened from the inside without a key, shall not in general be used in doors of exits and in doors of areas leading to exits.

Locks, which **always** can be opened from the inside without a key, are used in doors of exits and areas leading to the exits

- in accommodation premises and
- in institutions where the nature of operation does not require isolation.

Locks, which **during the normal use of the premises** can be opened from the inside without a key in an emergency, are used in

- assembly and business premises,
- office premises and
- production and storage premises.

The arrangements for access control must not prevent safe exit from a building.

10.6.4

Exits of accommodation premises, institutions and assembly and business premises and passageways to these exits shall in general be provided with emergency and exit lighting.

Guideline

Also other premises, from which evacuation may otherwise be difficult, shall be provided with emergency or exit lighting or both.

10.6.5

If the doors of exits and the access to them are not clearly visible or if other doors may confuse the evacuees, the exits and the access to them shall be marked, where required.

10.7 Calculation of evacuation time

10.7.1

For building works which are demanding from the point of life safety and in which the risks for evacuation safety depend on the use of the premises and the restricted or reduced capabilities of the occupants, a calculation of the evacuation time for the specific building work may be necessitated.

Guideline

The calculation of the evacuation time is used as a basis for working out the safety assessment set out in clause 11.7.

10.7.2

A calculation of the evacuation time may also be necessitated for other building works, if their considerable size or exceptional circumstances may endanger life safety.

ORGANISATION OF EXTINGUISHING AND RESCUE OPERATIONS

11.1 General requirements

11.1.1

The prerequisites for extinguishing fires and rescuing people shall be ensured in a building and its vicinity.

11.1.2

If the location, considerable size or exceptional circumstances of a building pose a particular danger to the safety of the occupants or to fire safety, it may be required that the building is to be provided with devices or arrangements which improve the fire safety in connection with the issuing of building permit.

11.1.3

When choosing devices for the improvement of fire safety it shall be ensured that their mode of operation and properties are applicable to the object.

Explanation

The Ministry of the Interior issues technical regulations and guidelines for devices intended for improvement of fire safety.

11.1.4

Installations, which are supposed to operate during fire, shall be made so that their working order is maintained for the required period of time.

11.1.5

The owner or possessor of a building shall supervise the working order of the fire safety devices.

11.2 Access to objects of extinguishing operation

11.2.1

Means shall be designed for providing fire and rescue service equipment an adequate access to buildings and the water supply facilities of the area (fire lane).

Explanation

The Decree on Rescue Services requires that fire lanes are marked.

11.2.2

Access shall be provided to each fire compartment of an attic for extinguishing operations.

11.2.3

Extinguishing routes shall be arranged so that basement storeys can be reached from ground level without a need to pass through the exits of the storeys. The minimum width of an extinguishing route is 900 mm.

Guideline

A separate extinguishing route is not required for a basement space of a single dwelling.

Extinguishing routes of basement storeys shall not be connected to fire and smoke-proof exits. Connections may be made to fire-proof exits through exit enclosures and to fire-separated exits through fire doors.

11.2.4

In buildings with more than 16 storeys lifts shall be equipped with such devices that the lifts can be used for rescue and extinguishing operations.

11.3 Smoke detector and automatic fire alarm installation

11.3.1

Smoke detectors connected to the power supply mains shall be installed into the following premises:

- accommodation premises with accommodation rooms for not more than 50 persons,
- institutions with not more than 25 beds,
- daycare premises intended for more than 25 persons in care,
- buildings of class P2 with 3–4 storeys and
- dwellings for special groups, for instance dwellings for the elderly.

Guideline

The operation of the installation shall be designed to alarm the personnel or those in danger quickly, so that there will be enough time for rescue or escape to safety from the hazardous part of the building.

Guideline

To these special groups belong occupants whose ability to notice a starting fire or whose ability to evacuate swiftly is impaired.

11.3.2

An automatic fire alarm installation shall be installed into accommodation premises and institutions with a higher number of occupants than stated in the previous clause.

11.3.3

If an automatic fire alarm installation is installed into a building or its fire compartment, derogations may be permitted concerning:

- the regulations pertaining to the gross floor area of the building and the area of its fire compartment, provided the fire load is less than 600 MJ/m² and the relevant premises are not for accommodation,
- the regulations intended to prevent the spread of fire to neighbouring buildings or to abate the danger of a regional fire.

When granting derogations it must be ensured that effective extinguishing operations can be commenced sufficiently swiftly.

Explanation

Such regulations are the regulations on the distance between buildings and on fire walls.

11.4 Smoke extraction

11.4.1

Means shall be designed and constructed in a building for adequate smoke extraction suitable for the different premises of the building.

Guideline

The arrangements for smoke extraction do not require particular measures if window openings and doorways can be used for smoke extraction or if the smoke can be extracted through actions of the fire department.

11.4.2

Means shall be provided for the extraction of smoke from, and for the flow of replacement air to fire-separated exits and fire-separated lift shaft.

Guideline

In buildings of classes P2 and P3 with two storeys means for smoke extraction from the second floor exit shall be arranged through a window or hatch with an area of at least 0,5 m² and which is simple to open or break.

In buildings of not more than 8 storeys means for smoke extraction from the upper part of the exits shall be arranged through a window or hatch with an area of at least 1,0 m² and which is simple to open or simple to break.

When designing smoke extraction from the exits in buildings with more than 8 storeys it must be ensured that smoke and combustion gases will not endanger the evacuation from the premises connected with the exits.

The arrangements concerning smoke extraction shall be negotiated with the local rescue authorities.

11.4.3

Means shall be provided for smoke extraction from the spaces of the basement storey, so that it will not be necessary to use fire-separated exits or fire-separated extinguishing routes for smoke extraction.

11.4.4

If required on justified grounds, smoke extraction shall be arranged using special measures, such as smoke vents, smoke venting windows or windows located in the upper part of the rooms and which are simple to open.

11.4.5

If an automatic smoke exhaust installation, which gives a fire alarm during operation, is installed in a building or its fire compartment, derogations may be allowed concerning:

- the regulations pertaining to the gross floor area of the building and the area of its fire compartment,
- the regulations pertaining to constructions, so that a slower rise in temperature may be applied for the design.

When considering derogations, attention shall be paid to the possibility of extinguishing or controlling a fire in its initial stage without endangering life safety.

11.5 Fire extinguishing devices

11.5.1

A building shall, if required, be provided with appropriate first-aid extinguishing equipments, so that the occupants of the building will be able to start extinguishing operations at the beginning of the fire.

Guideline

The need and type of first-aid extinguishing equipments are defined by the local rescue authority.

Explanation

First-aid extinguishing equipments for production and storage premises and garages are considered in parts E2 and E4 of the National Building Code of Finland.

11.5.2

Dry rising mains for extinguishing operations shall be installed in every staircase in all buildings with more than 8 storeys and in addition in every staircase in buildings of class P2 with 3 and 4 storeys.

11.5.3

If an automatic fire extinguishing system is installed in a building or its fire compartment, derogations may be allowed concerning:

- the regulations pertaining the gross floor area of the building and the area of its fire compartment,
- the regulations on the length of passageways to exit,
- the regulations on the classification of fire load,
- the regulations on constructions, so that the slower rise in temperature in general and the cooling of load-bearing constructions may be applied for the design,
- the regulations on surfaces,
- the regulations aiming at preventing the spread of fire to neighbouring buildings and to abate the hazard of a regional fire.

When considering derogations attention shall be paid to the possibilities of the rescue personnel to extinguish or control a fire in its initial stage without endangering life safety.

11.5.4

A building of class P2 with 3–4 storeys shall be provided with an automatic fire-extinguishing system, which is fit for the purpose.

11.6 Limitation signs

11.6.1

If an application for a permit relates to a design which is based on a smaller number of occupants than the size of the building would allow, or on an exceptionally small fire load, a sign indicating this limitation shall be placed in the building in an easily perceivable place.

11.7 Safety assessment

11.7.1

For building works which are demanding from the point of life safety and where the risks for fire safety depend on the use of the premises and the restricted or reduced capabilities of the occupants, a particular safety assessment shall be worked out at an early stage of the design work. The structural and other means, which are necessary for reaching a sufficient level of safety, are based on this assessment. The safety assessment is prepared through cooperation between the designers and users of the building work, the authorities responsible for safety issues and other necessary parties.

Guideline

Building works intended above are e.g. institutions and such accommodation premises and dwellings, which are intended for occupants whose evacuation capabilities are inferior than normally, due to their reduced capabilities.

Critical factors affecting the capabilities in fire situations are perceptive, comprehensive and locomotion faculty.

The principal designer is responsible for the availability of source information necessary for the design work.

For preparation of the safety assessment, safety related information is needed from all parties concerned. The parties managing the works define the nature of the activities and the available resources. The principal designer defines matters relating to the building. The rescue department provides information on the readiness of action.

Information for guidance

Contents

- 1 Classification systems
- 2 Classification of resistance to fire performance of building elements
- 3 Classification of reaction to fire performance of building materials
- 4 Classification of roof coverings
- 5 Clauses of the regulations and guidelines E1 to which the parallel application pertains
- 6 Building products belonging to classes A1 and A1_{FL}
- 7 Roof coverings belonging to class B_{ROOF}

1 Classification systems

The intention of the Construction Products Directive 89/106/EEC is to abolish technical barriers to trade within the European Economic Area. The Directive results e.g. in the use of common fire classification systems for construction products. The Member States may choose from the jointly agreed systems those classes they will use in their building regulations.

The fire classification systems are **classification of the resistance of fire performance of building elements, classification of the reaction to fire performance of building materials** and **classification of the external fire performance of roof coverings**.

Building elements

The classification system for building elements is based on Commission Decision 2000/367/EC. The system is not much different from the classification system of the former regulations. A prerequisite of the system is the use of EN standards for classification of building elements.

Building materials

The classification system for building materials is based on Commission Decision 2000/147/EC. The system is essentially different from the classification system of the former regulations. A prerequisite of the system is the use of EN standards for classification of building materials.

Parallel application of the new and old system is viable for 5 years. Table 1 in chapter 5 includes a compilation of the clauses of the regulations and guidelines E1 to which the parallel application pertain.

Roof coverings

The classification system for roof coverings is based on Commission Decision 2001/671/EC. The system differs from the former system in that only one actual class is available. This class, B_{ROOF}(t2), corresponds with class K2 concerning testing and the basis for assessment. There is no class corresponding with class K1.

2 Classification of resistance to fire performance of building elements

The classification system for the resistance to fire performance of building elements which is based on European standards is not essentially different from the system previously used in Finland. During the transition period the classification may be based on test methods and classifications according to EN standards or on methods and acceptance criteria according to Guideline 35 of the Ministry of the Environment "Rakennustuotteiden palotekninen hyväksyntä" (Fire technical approval of building products).

The duration of the transition period depends on the product. Factors affecting the period are e.g. the finalisation of harmonised European technical specifications and the CE marking of products, which relies on the use of European standards. The intention is to agree mutually between the Member States on a final transition to use European standards also for building elements to which CE markings do not pertain.

The material specific guidelines in part B of the building code contain particular chapters for fire technical design of load-bearing constructions. A parallel procedure is, for the time being, the use of Eurocode pre-standards together with national application documents. This procedure is in use before the implementation of EN Eurocodes.

Below is shown a list of final EN standards and standard proposals in various stages of preparation concerning fire resistance testing and classification of building elements.

Classification standards

prEN 13501-2

Fire classification of construction products and building elements

Part 2: Classification using data from fire resistance tests (excluding products for use in ventilation systems)

prEN 13501-3

Fire classification of construction products and building elements

Part 3: Classification using data from fire resistance tests on components of normal building service installations (other than smoke control systems)

Standards for test methods

SFS-EN 1363-1:1999

Fire resistance tests

Part 1: General requirements (1/2000)

SFS-EN 1363-2:1999 Fire resistance tests <i>Part 2: Alternative and additional procedures (1/2000)</i>	prEN 1366-7 Fire resistance tests for service installations <i>Part 7: Closures for conveyors and trackbound transportation systems</i>
SFS-EN 1364-1:1999 Fire resistance tests for non-loadbearing elements <i>Part 1: Walls (1/2000)</i>	prENV 13381-1 Contribution to fire resistance of structural members <i>Part 1: Horizontal protective membranes</i>
SFS-EN 1364-2:1999 Fire resistance tests for non-loadbearing elements <i>Part 2: Ceilings (1/2000)</i>	ENV 13381-2 Contribution to fire resistance of structural members <i>Part 2: Vertical protective membranes</i>
prEN 1364-3:1999 Fire resistance tests for non-loadbearing elements <i>Part 3: Curtain walling - full configuration</i>	ENV 13381-3 Contribution to fire resistance of structural members <i>Part 3: Applied protection to concrete members</i>
SFS-EN 1365-1:1999 Fire resistance tests for loadbearing elements <i>Part 1: Walls</i>	ENV 13381-4 Contribution to fire resistance of structural members <i>Part 4: Applied protection to steel members</i>
SFS-EN 1365-2:1999 Fire resistance tests for loadbearing elements <i>Part 2: Floors and roofs (1/2000)</i>	ENV 13381-5 Contribution to fire resistance of structural members <i>Part 5: Applied protection to concrete/profiled sheet composite members</i>
SFS-EN 1365-3:2000 Fire resistance tests for loadbearing elements <i>Part 3: Beams (1/2000)</i>	ENV 13381-6 Contribution to fire resistance of structural members <i>Part 6: Applied protection to concrete filled hollow steel composite columns</i>
SFS-EN 1365-4:1999 Fire resistance tests for loadbearing elements <i>Part 4: Columns (1/2000)</i>	ENV 13381-7 Contribution to fire resistance of structural members <i>Part 7: Applied protection to timber members</i>
SFS-EN 1366-1:1999 Fire resistance tests for service installations <i>Part 1: Ducts (1/2000)</i>	SFS-EN 1634-1:2000 Fire resistance tests for door and shutter assemblies <i>Part 1: Fire doors and shutters</i>
SFS-EN 1366-2:1999 Fire resistance tests for service installations <i>Part 2: Fire dampers (1/2000)</i>	prEN 14135 <i>Coverings – determination of fire protection ability</i>
prEN 1366-3 Fire resistance tests for service installations <i>Part 3: Penetration seals</i>	prEN 13216 <i>Fire resistance test for chimneys</i>
prEN 1366-4 Fire resistance tests for service installations <i>Part 4: Linear joint seals</i>	
prEN 1366-5 Fire resistance tests for service installations <i>Part 5: Service ducts and shafts</i>	

3 *Classification of reaction to fire performance of building materials*

The new classification system for reaction to fire performance of building materials is essentially different from the system previously used in Finland. For classification of reaction to fire performance of building materials either the new or old classification system may be used until the end of the year 2006 according to the regulations and guidelines E1. CE marking of products requires, however, always that the new system is being used.

E1 / 2002

Below is shown a list of classification and test standards required by the new fire classification system.

Classification standard

EN 13501-1

Fire classification of construction products and building elements

Part 1: Classification using data from reaction to fire tests

Standards for test methods

EN ISO 1182

Reaction to fire tests for building products
Non-combustibility test

EN ISO 1716

Reaction to fire tests for building products
Determination of the gross calorific value

EN ISO 9239-1

Reaction to fire tests for floorings
Part 1: Determination of the burning behaviour using a radiant heat source

EN ISO 11925-2

Reaction to fire tests
Part 2: Ignitability for building products when subjected to direct impingement of flame

EN 13823

Reaction to fire tests for building products
Building products excluding floorings – Thermal attack by a single burning item

E1 / 1997

The fire technical classification is based on regulations and guidelines E1 of 1997 and on methods and acceptance criteria according to Guideline 35 of the Ministry of the Environment.

4 *Classifications of roof coverings*

The new classification system for the external fire performance of roof coverings is not essentially different from the system previously used in Finland. Test 2 of the European test standard corresponds with the method previously used in Finland. The acceptance criteria for test 2 according to the European classification standard proposal correspond with the acceptance criteria used in Finland. Under the new system we have only one available class, B_{ROOF}(t2). Class B_{ROOF}(t2) corresponds with class K2 previously used in Finland.

Classification criteria

For the time being the acceptance criteria for roof coverings of class K2 according to Guideline 35 of the Ministry of the Environment are used as acceptance criteria. Clause 3.4 of the Guideline considers e.g. testing the roof covering on different types of substrates. The roof covering and its substrate are tested together. It is to be noted that in addition to the non-combustibility/combustibility of the substrate, also the density of the substrate has a great influence on the performance of the roof covering in fire situations. This must be considered when applying clause 8.4.3 of E1.

prEN 13501-5

Fire classification of construction products and building elements

Part 5: Classification using data from external fire exposure to roof tests

The classification standard for roof coverings is still under preparation. After its finalisation, the acceptance criteria included therein will be applied.

Standard for test methods

ENV 1187

Test method for external fire exposure to roofs

The test standard includes three specific tests. Test 2 is used in Finland.

5 *Clauses of the regulations and guidelines E1 to which the parallel application pertains*

Below is a compilation of the clauses of the regulations and guidelines E1 which are affected by the change of classification system for reaction to fire performance of building materials.

Fire classification	Building materials, surfaces of internal walls and ceilings, surfaces of floorings
Table 8.2.2	Class requirements for internal surfaces
Table 8.3.4	Class requirements for surfaces of external walls
Table 1	Clauses of the regulations and guidelines to which the parallel application of the new and old system pertains.

E1 / 1997 Fire classification

Building materials

Non-combustible

A building material is considered non-combustible, if it neither ignites nor generates practically any smoke or combustible gases.

Combustible

A building material is considered combustible, if it does not meet the requirements prescribed for a non-combustible building material.

A building material may also be **nearly non-combustible**.

Surfaces of internal walls and ceilings

IGNITABILITY

The surfaces of building elements and building materials are divided into classes according to the extent to which they ignite as a result of local thermal action.

Class 1 (non-igniting surface)

- surface which does not ignite or ignites only with difficulty.

Class 2 (slowly igniting surface)

- surface which ignites slowly.

Surfaces, which do not meet the requirements prescribed for classes 1 or 2, are considered as easily ignitable.

FIRE-SPREADING CHARACTERISTICS

Surfaces of building elements and building materials are divided into classes according to the extent to which they spread fire and generate smoke.

Class I (non-fire spreading surface)

- does not contribute at all to the spread of fire or does so only to a minor extent, and does not generate smoke to a great extent.

Class II (slowly fire-spreading surface)

- does neither contribute substantially to the spread of fire nor generate smoke to a great extent.

Surfaces, which do not meet the requirements, prescribed for classes I or II, are considered as rapidly fire-spreading.

When determining the ignitability and fire-spreading classes of surfaces, the properties of the finished construction, which are affected besides by the outermost surface, also by its substrate and its fixing, shall be examined.

If necessary, also other hazards caused by fire conditions shall be taken into account, such as the generation of toxic gases as a result of heat, formation of droplets, vaporisation, or the danger of the surface or its substrate falling down.

Floorings

Class L

Floorings, which contribute to the spread of fire only to a minor extent, protect their backing from ignition and do not generate smoke to a great extent.

TABLE 8.2.2 CLASS REQUIREMENTS FOR INTERNAL SURFACES
ignitability class / fire-spreading class

Use of the building	Object	Fire class of the building		
		P1	P2	P3
Dwellings	walls and ceilings floorings	2 / - ¹⁾ —	1 / I ²⁾ —	2 / - ¹⁾ —
Accommodation premises	walls and ceilings floorings	2 / - —	1 / I —	2 / - —
Institutions	walls and ceilings floorings	1 / I L	1 / I L	2 / - —
Assembly and business premises – fire load under 600 MJ/m ² and – area is ≤ 300 m ²	walls and ceilings floorings	2 / - —	1 / I —	2 / - —
– area is over 300 m ²	walls and ceilings floorings	1 / - —	1 / I —	2 / - —
– fire load ≥ 600 MJ/m ²	walls and ceilings floorings	1 / I L	1 / I L	1 / I —
Office premises	walls and ceilings floorings	2 / - ¹⁾ —	1 / I ²⁾ —	2 / - ¹⁾ —
Production and storage premises – fire hazard class 1	walls and ceilings floorings	2 / - L	1 / I L	2 / - —
– fire hazard class 2	walls and ceilings floorings	1 / I non-combustible	1 / I non-combustible	1 / I non-combustible
Motorcar repair shops and service stations, garages (in garages possibility of derogation according to part E4 of the National Building Code of Finland)	walls and ceilings floorings	1 / I non-combustible	1 / I non-combustible	1 / I non-combustible
Attics and basements – usable attics	top surface of uppermost floor	non-combustible	1 / I	2 / -
– unusable attics and low attic spaces and voids	top surface of uppermost floor	1 / I	1 / I	- / -
– basements in general	walls and ceilings floorings	1 / - L	1 / I L	2 / - L
– rooms for technical service	walls and ceilings floorings floorings of boiler room	1 / I L non-combustible	1 / I L non-combustible	1 / I L non-combustible
Exits in all buildings	walls and ceilings floorings	1 / I L	1 / I L	1 / I L
Internal corridors in accommodation and office premises	walls and ceilings floorings	1 / II L	1 / I L	1 / II —
Saunas	walls and ceilings floorings	2 / - —	2 / - —	2 / - —

Symbols in the Table: — = no class requirement

Notes to the Table:

- ¹⁾ Minor parts of wall surfaces may be coated with building materials of class - / -.
²⁾ Minor parts of wall surfaces may be coated with building materials of class 2 / -. Instead of surfaces of class L, massive wood with a thickness of at least 15 mm, may be used.

Guideline:

Possibility of derogation in accordance with Clause 8.2.5 with regard to surfaces, for which surfaces class 1 / I or 1 / - has been required.

TABLE 8.3.4 CLASS REQUIREMENTS FOR EXTERNAL WALL SURFACES
ignitability class / fire-spreading class

	Fire class and use of the building					
	P1		P2		P3	
	Buildings of class P1 in general	Residential and office premises with not more than 4 storeys	Institutions	Residential and office premises with 3–4 storeys	Other buildings of class P2	
External surfaces of external wall	1 / I ¹⁾	1 / I ²⁾	1 / I ²⁾	1 / I ²⁾	2 / –	2 / –
Surfaces adjacent to ventilation gaps	1 / I ¹⁾	1 / I ²⁾	1 / I ²⁾	1 / I ²⁾	2 / –	– / –

Notes to the Table:

¹⁾ In buildings of class P1 with not more than 8 storeys, a part of the surface of the façades may be of class 2 / –, if the constructions surrounding such parts protect the wall surface from the spread of fire. Combustible building materials may be used to a small extent for the fixing of façade boards in buildings of not more than 8 storeys.

²⁾ The use of building materials of class 2 / – is permitted under the provisions of Clause 8.3.5.

TABLE 1 CLAUSES OF THE REGULATIONS AND GUIDELINES TO WHICH THE PARALLEL APPLICATION OF THE NEW AND OLD SYSTEM PERTAINS *

Clause E1/2002 (E1/1997)	Object	Class	
		E1/2002	E1/1997
table 6.2.1	load-bearing constructions, non-combustibility thermal insulations	A2-s1, d0 A2-s1, d0	non-combustible non-combustible or nearly non-combustible
7.2.3 (7.2.2)	fire-separating building elements	A2-s1, d0	non-combustible or nearly non-combustible
7.5.1	ventilation ducts	A2-s1, d0	non-combustible
guideline 7.6.1	partitions in eaves	B-s1, d0	not spreading fire
8.2.2 (8.2.4), table 8.2.2	internal surfaces walls and ceilings floorings	A2-s1, d0...— A2 _{FL} ... —	1 / I ... - / - non-combustible ... —
8.2.3 (definitions)	protective covering, if the underlying construction	A2-s1, d0 C-s2, d1 or worse	non-combustible or nearly non-combustible not non-combustible or nearly non-combustible
8.2.4, guideline 8.2.4 (8.2.5)	derogations surfaces	one main class, smoke production and formation of droplets are considered D-s2, d 2	order: 1 / I, 1 / II, 1 / -, 2 / - 2 / -
8.3.1, guideline 8.3.1	external walls thermal insulation framework thermal insulation	B-s1, d0 inferior to B-s1, d0, D-s2, d2 A2-s1, d0	non-combustible or nearly non-combustible combustible combustible non-combustible or nearly non-combustible
8.3.2	external walls framework thermal insulation	D-s2, d2 A2-s1, d0	combustible combustible non-combustible or nearly non-combustible
table 8.3.4	external walls	B-s1, d0 ... —	1 / I ... - / -
8.3.5	external walls	D-s2, d2	2 / -
8.4	substrate of roof covering	A2-s1, d0	non-combustible or specifically approved
9.2.2, table 9.2.2, guideline 9.2.2, 9.2.3	fire wall roof constructions fire wall/door	A1 A2-s1, d0 A1/A2-s1, d0	non-combustible non-combustible non-combustible/ non-combustible
10.5.3 (10.5.4)	stairs	A2-s1, d0	non-combustible

* The table contains the clauses, which are affected by parallel applications. However, the full text of the relevant clauses of the regulations and guidelines should always be checked.

6 *Building products belonging to classes A1 and A1_{FL}*

The building products listed in Table 2 can in general be considered as belonging to class A1 and A1_{FL} without the need for testing and further approval. The table is based on Commission Decision 96/603/EC, amended 2000/605/EC.

TABLE 2 **BUILDING PRODUCTS ACCEPTED WITHOUT TESTING AND CLASSIFICATION**

General notes:

Products should be made only from one or more of the following materials if they are to be considered as Class A1 and Class A1_{FL} without testing. Products made by gluing one or more of the following materials together will be considered Class A1 and Class A1_{FL} without testing provided that the glue does not exceed 0,1 % by weight or volume (whichever is the more onerous).

Panel products (e.g. of insulating material) with one or more organic layers, or products containing organic material, which is not homogeneously distributed (with the exception of glue), are excluded from the list.

Product made by coating one of the following materials with an inorganic layer (e.g. coated metal products) may also be considered as Class A1 and Class A1_{FL} without testing.

None of the materials in the table is allowed to contain more than 1,0 % by weight or volume (whichever is the more onerous) of homogeneously distributed organic material.

Material	Notes
Expanded clay	
Expanded perlite	
Expanded vermiculite	
Mineral wool	
Cellular glass	
Concrete	Includes ready-mixed concrete and precast reinforced and prestressed products.
Aggregate concrete (dense and lightweight mineral aggregates, excluding integral thermal insulation)	May contain admixtures and additions (e.g. PFA), pigments and other materials. Includes precast units.
Autoclaved aerated concrete units	Units manufactured from hydraulic binders such as cement and/or lime, combined with fine materials (siliceous materials, PFA, blast furnace slag), and cell generating material. Includes precast units.
Fibre cement	
Cement	
Lime	
Blast furnace slag/pulverized fly ash (PFA)	
Mineral aggregates	
Iron, steel and stainless steel	Not in finely divided form.
Copper and copper alloys	Not in finely divided form.
Zinc and zinc alloys	Not in finely divided form.
Aluminium and aluminium alloys	Not in finely divided form.
Lead	Not in finely divided form.
Gypsum and gypsum based plasters	May include additives (retarders, fillers, fibres, pigments, hydrated lime, air and water retaining agents and plasticisers), dense aggregates (e.g. natural or crushed sand) or lightweight aggregates (e.g. perlite or vermiculite).

Mortar with inorganic binding agents	Rendering/plastering mortars and mortars for floor screeds based on one or more inorganic binding agent(s), e.g. cement, lime, masonry cement and gypsum.
Clay units	Units from clay or other argillaceous materials, with or without sand, fuel or other additives. Includes bricks, tiles, paving and fireclay units (e.g. chimney liners).
Calcium silicate units	Units made from a mixture of lime and natural siliceous materials (sand, siliceous gravel or rock or mixtures thereof). May include colouring pigments.
Natural stone and slate products	A worked or non-worked element produced from natural stone (magmatic, sedimentary or metamorphic rocks) or slate.
Gypsum unit	Includes blocks and other units of calcium sulphate and water, that may incorporate fibres, fillers, aggregates and other additives, and may be coloured by pigments.
Terrazo	Includes precast concrete terrazotiles and in-situ flooring.
Glass	Includes heat strengthened, chemically toughened laminated and wired glass.
Glass ceramics	Glass ceramics consisting of a crystalline and a residual glass phase.
Ceramics	Includes dust-pressed and extruded products, glazed or unglazed.

7 Roof coverings belonging to class B_{ROOF}

The roof coverings listed in Table 3 can in general be considered as belonging to class B_{ROOF} without the need for testing or further approval. The table is based on Commission Decision 2000/553/EC.

TABLE 3 ROOF COVERINGS ACCEPTED WITHOUT TESTING AND CLASSIFICATION

Roof covering product/material ¹⁾	Specific conditions
Slates: natural slates, stone slates ²⁾	Satisfies the provisions of Commission Decision 96/603/EC.
Tiles: stone, concrete, clay, ceramic or steel roof tiles ²⁾	Satisfies the provisions of Commission Decision 96/603/EC. Any external coating shall be inorganic or have a PCS $\leq 4,0$ MJ/m ² or a mass ≤ 200 g/m ² .
Fibre reinforced cement: flat and profiled sheets, slates ²⁾	Satisfies the provisions of Commission Decision 96/603/EC or has a PCS $\leq 3,0$ MJ/kg.
Flat and profiled metal sheets: aluminium, aluminium alloy, copper, copper alloy, zinc, zinc alloy, uncoated steel, stainless steel, galvanised steel, coil coated steel, vitreous enamel steel ²⁾	Thickness $\geq 0,4$ mm. Any external coating shall be inorganic or have a PCS $\leq 4,0$ MJ/m ² or a mass ≤ 200 g/m ² .
Products intended to be fully covered in normal usage (by the inorganic coverings listed to the right)	Loose laid gravel with a thickness of at least 50 mm or a mass ≥ 80 kg/m ² (minimum aggregate size 4 mm, maximum 32 mm). Sand/cement screed to a thickness of at least 30 mm. Cast stone or mineral slabs of at least 40 mm thickness.

Notes to the table: ¹⁾ A roof covering is a product forming the uppermost layer of a roof.

²⁾ The substrate of the roof covering is at least of class D-s2, d2 and its density is at least 400 kg/m³.

Symbol: PCS is gross calorific potential.