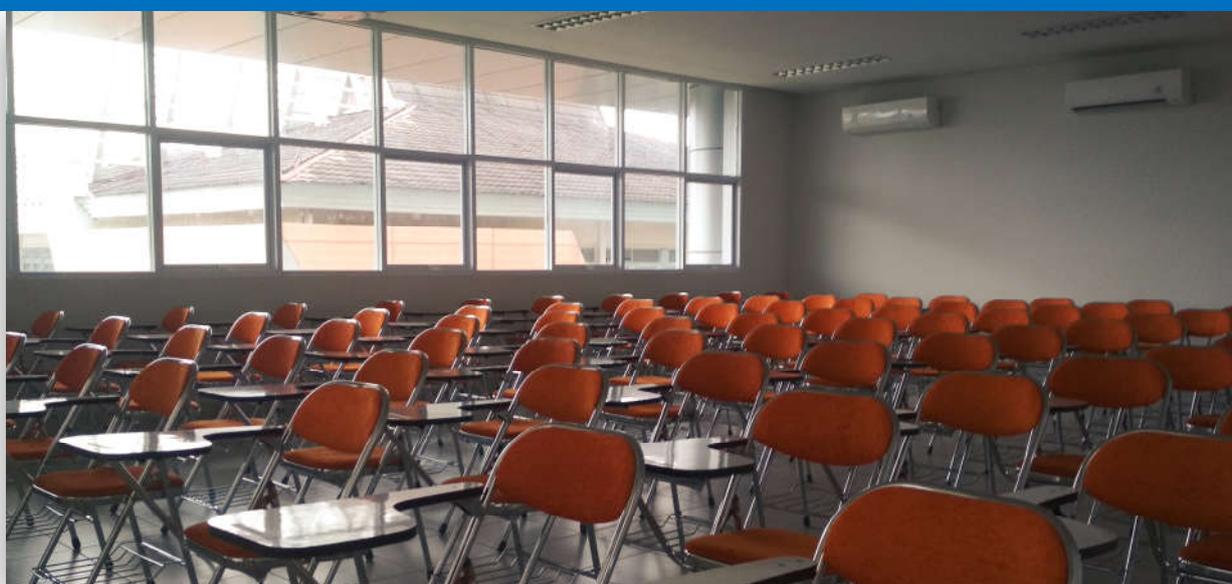


Fire protection in schools

CFPA-E Guideline No 39:2021 F





FOREWORD

CFPA Europe develops and publishes common guidelines in order to achieve similar interpretation in the European countries and to give examples of acceptable solutions, concepts and models. CFPA Europe has the aim to facilitate and support fire protection, security and protection against natural hazards across Europe, and the whole world.

The market imposes new demands for quality and safety. Today, fire protection, security and protection against natural hazards form an integral part of a modern strategy for survival, sustainability and competitiveness.

These Guidelines are primarily intended for the public. They are also aimed at rescue services, insurers, consultants, safety companies and the like so that, in the course of their work, they may be able to help manage risk in society.

These Guidelines reflect best practice developed by the national members of CFPA Europe. Where these Guidelines and national requirements conflict, national requirements shall apply.

This Guideline has been compiled by the Guidelines Commission and is adopted by all members of CFPA Europe.

Copenhagen, September 2021
CFPA Europe

Jesper Ditlev
Chairman

Cologne, September 2021
Guidelines Commission

Hardy Rusch
Chairman





Contents

1	Introduction	5
2	Scope	5
3	Definitions.....	6
4	Location.....	8
4.1	External hazards	8
4.2	Fire brigade access.....	8
4.3	Protection from earthquakes	9
5	Structural fire protection.....	9
5.1	Fire resistance of bearing structures	9
5.2	Fire compartments	10
5.3	Laboratories	10
5.4	Kitchens	11
5.5	Reaction to fire	11
5.6	Facades and roofs	12
5.7	Ventilation	12
5.8	Historical buildings	12
6	Egress	13
6.1	Classroom doors	13
6.2	Sports halls, multipurpose halls, auditoriums, cinemas, theatres, restaurants	13
6.3	Laboratories	13
6.4	Floor exits	13
6.5	Stairs	14
6.6	Final exits.....	15
6.7	People with disabilities.....	15
6.8	Assembly point	15
6.9	Schools for people with disabilities.....	16
7	Technical fire protection	16
7.1	Technical systems	16
7.2	Fire detection and alarm system	17
7.3	Fire extinguishers.....	17
7.4	Water hose systems	17
7.5	Emergency light	17
7.6	Smoke ventilation.....	18
7.7	Other fixed fire safety systems	18
7.8	Safety signage	18
7.9	Lifts	19
8	Organizational fire protection.....	19
8.1	Arson	19
8.2	Maintenance works, hot works	19
8.3	Emergency and evacuation plan.	20
8.4	Training plans and fire drills	20
8.5	Smoking.....	20
8.6	Maintenance and cleanliness	20
8.7	Flammable liquids and gases.....	21



8.8	Dangerous substances and chemicals	21
8.9	Waste management and disposal	21
9	European guidelines.....	22

Key words:



1 Introduction

This Guideline is concerned with fire safety in schools, new and existing. In these activities, there is a great variety in the age of occupants and in their awareness concerning the exact characteristics of the spaces that they occupy.

Most European countries have national or local codes concerning the fire safety of schools, but the legislation can be very different between countries.

The intention of this Guideline is to provide a common basis for the fire safety of all schools in all European countries, excluding nurseries and schools with small numbers of people. Dormitories and student residences are not covered by this Guideline.

This guideline is primarily intended for those responsible for fire safety in schools. It is also addressed to the rescue services, consultants, safety companies and others who, in course of their work, may be able to help to increase the level of fire safety in schools.

2 Scope

This guideline addresses the fire safety issues of schools, as indicated in the definitions.

The aim of this guideline is to provide school managers and safety consultants with some basic principles indicating the process to improve the fire safety of schools, new and existing. Due to the great number of existing schools, the measures contained in this document are easy to implement. This means that new schools could easily implement a higher level of safety than those indicated in the present guideline.

In general, new schools and the new buildings extending existing schools should apply the Guideline entirely. Existing schools are sometimes in old or historical buildings; in these cases, it can be difficult to apply some or all of the recommendations of this Guideline. It may be necessary and appropriate to appoint a qualified fire engineer to carry out a more advanced risk assessment.

Schools can vary a great deal in dimensions, number of people, age of students, the ability of students to take care of themselves without help, age of the buildings, etc. In some cases, schools can include dormitories, kitchens, laboratories, and rooms or buildings where different activities take place. Therefore, in addition to what is indicated in this guideline, in some cases it may be necessary or appropriate to appoint a qualified fire engineer to carry out a more advanced risk assessment. The fire risk assessment must take into account the fire resistance of load-bearing structure and compartmentation, the access routes of emergency vehicles, the conformity of different technical equipment, the maintenance of the whole structure, etc..

This guideline does not apply to:

- Nurseries;
- Schools with less than 30 people present at one time;
- Training events that occur completely outdoors.



The objectives of this Guideline are:

- Reduce the probability of a fire, or even avoid the possibility of a fire;
- Reduce, in case of fire, the consequences of the fire on people and on properties;
- Guarantee the maximum possible safety for people;
- Reduce the intervention by external Fire fighters and assure the maximum possible safety for Fire fighters in case of intervention.

3 Definitions

School: an organized institution designed to provide learning spaces and learning environments for students under the direction of teachers. This definition includes any kind of teaching structure, including for example state schools, public schools, technical schools, academies and universities, regardless of the size of the school, the number or the age of students.

Nursery: a structure for young children, normally under 6 years old, in which pupils are so young that they cannot act individually and/or take care of themselves without help.

Type 1 school: school with maximum number of people that are contemporaneously present between 30 and 100.

Type 2 school: school with maximum number of people that are contemporaneously present between 101 and 500.

Type 3 school: school with maximum number of people that are contemporaneously present exceeding 500.

Responsible: the person who is responsible of the fire safety issues of the school. In general, he/she is the school manager, but the school manager can assign a particular person to take care of the fire safety issues of the school by means of a written document.

Protected stair: a stair, which is protected towards all surrounding rooms by means of:

- EI 30 (or more) fire resistant walls, and
- at least EI 30-Sa (or more) fire resistant doors.

Smoke proof stair: a stair, which is protected towards all surrounding rooms by means of:

- EI 30 (or more) fire resistant walls, and
- at least EI 30-Sa (or more) fire resistant doors, and
- a ventilating system able to keep the stair free from smoke.

External stairs can be considered as smoke proof stairs.

One way egress path length: The length of the path from any point of the premises until the first point in which people can egress in two different directions, each of them creating at least an angle of 45° or divided by a fire-resistant wall.



Number of people or occupancy: the maximum number of people that can reasonably occupy the building/s under any conditions. This includes the sum of any kind of occupants, including teachers, students, technical personnel, external consultants, maintenance personnel, parents of students.

In general, in large school complex, the number of people must be considered calculating all buildings, if they are connected one to each other internally. If one or more buildings are not internally connected, then they must be considered individually in the calculation of the number of people.

Evacuation lift: a lift inserted inside a REI60 protected enclosure, built according to EN 81-72, with exit at ground floor directly outside or by means of a protected corridor, without steps. Floor, walls and ceiling of the lift must be in not combustible materials.

Protected corridor: a corridor which is protected towards all surrounding rooms by means of:

- EI 30 (or more) fire resistant walls, and
- at least EI30-Sa (or more) fire resistant doors.

Automatic emergency lowering system for lifts: this system detects the loss of standard electrical power, and then automatically cancels any floor calls and, using a standby battery power, safely lowers the lift to the safest landing (normally ground floor, opens the door and prevents any other use of the lift until after the end of the emergency.

Laboratory: a room where dangerous substances or mixtures, such as chemicals, flammable gases or liquids, pressurized gases, explosives, radioactive materials, biological hazards, etc., are present in significant quantity. A significant quantity can be for example 50 litres of flammable liquids, 220 liters of pressurized gases, or as determined by the results of the fire risk assessment.

High risk area: rooms or areas where dangerous activities are carried out, or where dangerous¹ substances or mixtures are used and/or stored. High risk areas in general should include for example kitchens, laboratories, large archives, large stock rooms, technical rooms (such as boiler rooms, electrical transformer rooms, rooms where the charging of a large numbers of batteries is carried out, compressor rooms, etc.), laundries, garbage disposal areas, covered parking lots.

Refuge for disabled people: a place or room, in communication with and close to a fire exit stair, having sufficient dimensions for all disabled people who might be expected to be present on that floor. As a place, they can wait for assistance to be taken down the stairs. The place must not constitute a hindrance for other egressing people. The stair must be protected or preferably smoke-proof. Inside the refuge, there must be at least one emergency light, appropriate signage according to ISO 7010-E24, indications about the correct behavior, and preferably a bi-directional communication system to let the people communicate with Fire fighters at ground floor.

The refuge area is not required on ground floors.

¹ Dangerous substances and mixtures in general include flammable gases and liquids, easily combustible solids like for example paraffin, corrosive substances, explosives and rooms susceptible to contain an explosive atmosphere, biological hazards, radioactive substances, toxic substances, high pressure containers.



Height of the building: Difference between the highest level where a fire truck can approach the building and the highest accessible floor.

Floors where there is a reduced number of personnel and only for limited periods, such as technical rooms, can be excluded

Ground floor: a floor that can be accessible horizontally from outside and that can guarantee the horizontal egress of people. One single step not exceeding 3 cm downhill from inside to outside can be excluded Ramps with a slope not exceeding 8 % are to be considered as horizontal.

It should be noted that, depending on the particular formation of the external terrain, a school can have more than one ground floor.

4 Location

4.1 External hazards

In general, schools should be located sufficiently far from structures or buildings with high risk of fire or explosion, like for example oil refineries, flammable gas deposits, nuclear plants, etc. in order that, in the event of an accident in those places, people in the school can be evacuated before they are exposed to excessive risk.

The school should be protected from floods, landslides, avalanches, external forest fires, or other natural hazards in a way that evacuation can take place in time.

4.2 Fire brigade access

At any time the driveway to the building must be kept free for the fire department. If possible, around the entire building, a lane for fire brigade should be kept free to ensure that the access for the fire brigade is possible from all building sites.

In general, Fire fighting vehicles should be able to access the premises with roads having the following measures:

- Minimum width: 3,5 m;
- Minimum free height: 4 m;
- Maximum turning radius: 13 m;
- Maximum slope: 10 %;
- Load resistance: 20 t, 8 on the front axis and 12 on the rear axis (wheelbase 4 m).

If one or more of these measures cannot be respected, then a specific fire risk assessment must be done.

For all buildings taller than 12 m, the Fire fighters ladder should be able to approach at least one window of each floor; alternatively, if the building is divided internally and no communications exist between stairs, the Fire fighters ladder should be able to approach at least one window of each independent stair.



If the ladder is not able to approach the building, then a specific fire risk assessment must be done, and further fire safety measures may be required e.g. that all stairwells are smoke proof.

4.3 Protection from earthquakes

Earthquakes often can be a cause of fire, due to breaks in gas pipes, fire system failures, and many other causes. Therefore, the safety from earthquakes is crucial for fire safety, too.

The schools Responsible Person must take into account the location of the school and consult the seismic maps of the region. Normally countries are divided in different seismic areas, depending on the expected severity of a possible earthquake.

When a school is inside a seismic area, then:

- The bearing structures must be designed, installed and verified in order to conform to the applicable national or local regulations in terms of resistance to earthquakes;
- All heavy furniture must be firmly fixed to the walls;
- All heavy materials have to be preferably stored near the floor, and not on high shelves;
- All internal technological systems must be designed, installed and verified in order to avoid falling pieces, especially along egress routes;
- False ceilings and suspended ceilings should be designed, installed and verified in order to avoid falling pieces and should be avoided along egress routes;
- All fire safety systems must be designed, installed and verified in order to guarantee the needed efficiency also after an earthquake, according to a specific fire risk assessment;
- The main gas pipe must have an automatic general valve that closes the pipe in case of lack of electricity supply;
- The periodical fire drills must include a drill concerning the correct behavior in case of earthquake.

During the evacuation of people, the internal fire service should take into account that minor tremors often follow strong earthquakes.

The use of lifts after an earthquake is forbidden until the system has been completely revised and verified by a qualified technician.

5 Structural fire protection

5.1 Fire resistance of bearing structures

In general, schools should be located in buildings where the fire resistance of the bearing structures is sufficient to guarantee the egress of all occupants and the safe intervention of Fire fighters.

For schools with all the following characteristics:

- the training activity is exclusively performed at ground floor(s);
- completely isolated from any other building;
- with possibly one basement and one first floor without classrooms (for example used only for offices, archives or technical rooms);



- with easy egress to outside, it's possible to accept bearing structures with no fire resistance.

In all other cases, the bearing structures should be compatible with the effective fire load, with a minimum of 30 minutes.

Tall buildings (indicatively over 24 m) should have a higher fire resistance of bearing structures, indicatively R120, following the fire risk assessment.

5.2 Fire compartments

School-serving uses (such as classrooms, group rooms, staff rooms, break rooms, server rooms, cleaning rooms, teacher's offices) can be grouped together in the same fire compartment. The same also applies for gym uses (such as dressing rooms and public galleries).

In general, high-risk areas should be included in a specific fire compartment.

All rooms that can be used as sports halls, multipurpose halls, auditoriums or similar, exceeding 100 people, should be a specific fire compartment.

A specific risk assessment will determine the exact fire resistance of the fire compartments at least for the following:

- In student residences and dormitories, a fire can start when people are asleep, so in general these buildings or parts of buildings must be separated from all other parts of the buildings by 120 minutes fire resistant structures;
- schools or part of the schools where there is a relevant number of people with disabilities or people not able to take care by themselves should be a specific fire compartment;
- tall buildings (indicatively over 24 m) should have a higher fire resistance in order to guarantee the egress of people and the safe intervention of Fire fighters.

Please note that student residences and dormitories are not covered by this guideline.

5.3 Laboratories

In general, laboratories should not be placed in basements. If this is not possible, a specific risk assessment needs to be done.

A list with all possible dangerous materials must be available in each laboratory in which these substances are used:

- must be a specific fire compartment, with fire separations of at least 60 minutes of fire resistance;
- doors need to be 60 minutes fire resistant, with push-bars, opening outwards;
- in general, at least two different exits in opposite direction should be present;
- a fire detection and alarm system must be designed, installed and maintained according to national or local regulations.

If necessary, near the entrance of the laboratory a notice or list of the maximum amount of dangerous materials must be installed on the wall in plain sight.



All laboratories in which gas with density over 0.8 are used or stored, should be placed at ground floor with no possible access or connection to basements. These rooms should have ventilating systems with openings in the upper and lower part of walls.

In laboratories in which radioactive substances or radioactive machinery are used, it's forbidden to use or store flammable substances.

Gas pipes and flammable liquids pipes must have an internal and an external manual shutter. The shutter must be provided with clear signage.

All gas burners must have automatic gas shut off in case of lack of flame.

All systems and equipment must be kept in good conditions and regularly cleaned according to a specific maintenance and cleaning program.

All systems and equipment that, in case of lack of normal power supply, could represent a risk for people must have an emergency power supply.

Laboratories should apply the CFP-A-E Guideline No. 28:2012 F "Fire safety in laboratories".

5.4 Kitchens

Kitchens should be preferably electric.

All hoods and cooking appliances must be kept in good conditions and regularly cleaned according to a specific maintenance and cleaning program. For suggestions concerning this topic, please refer to CFP-A-E Guideline 9:2012 F, "Fire safety in restaurants".

All floors, walls and ceilings must be in not combustible materials.

All gas burners must have automatic gas shut off.

5.5 Reaction to fire

Materials should be chosen with consideration given to their contribution to fire. The choice of materials, such as furniture and decorations, should have lower reaction to fire classification². Choosing non-combustible or low combustible materials instead of easily combustible materials can be extremely useful in reducing the risk of a fire and the possibility of a quick fire spread, resulting in more time available for fire extinguishing or evacuation.

Thorough consideration should be made in the choice of:

- covering materials for floors, walls and suspended ceilings;

² According to EN 13501, class A1 is the better one and means that the material is completely not combustible. The worst class is F.



- materials that can take flame on both sides, for example curtains and other fabrics or decoration;
- carpets and mats
- upholstered furniture;
- insulating materials, for any use (acoustic, thermal, etc.), especially if used on facades or roofs.

Inside laboratories, high-risk areas and along all egress routes, the covering materials for floors, walls and ceilings should be maximum in class:

- Cfl,s1 for floors;
- B-s2,d1 for walls;
- B-s3,d0 for ceilings.

5.6 Facades and roofs

Façades and roofs should be constructed with noncombustible materials. This means considering all the materials that form the façade and roof, as a whole and not only the last external layer.

When this is not possible, then a specific fire risk assessment has to be made, which would consider:

- The installation of a sprinkler system in the entire building;
- The installation in a façade of non - combustible layers, in adequate dimensions, around all openings (doors, windows) and along all slabs, at all floors;
- The installation on a roof of horizontal non - combustible layers, in adequate dimensions, around all openings (smoke vents, skylights) and corresponding with the firewalls installed below the roof.

5.7 Ventilation

In general, high-risk areas should have adequate openings (doors, windows, smoke vents on roofs, mechanical systems, etc.) to guarantee the evacuation of the smoke and heat in case of fire.

As a second choice, if the above types of openings are not possible, skylights that are easily broken by Fire fighters or even easy to melt when hot can be used.

All openings must not be under or close to egress paths.

5.8 Historical buildings

If a school is at least in part inside an historical building, all interventions must be carried out in accordance with the local heritage authority.



6 Egress

6.1 Classroom doors

In general, classroom doors should open outwards and have a minimum width of 80 cm, with a handle according to EN 179. If opening the door outwards is not possible, for example because it causes the risk of accidents for people in the corridors, then a specific risk assessment should be made. In new buildings, recessed doors opening outwards are to be preferred.

Classrooms with more than 50 people should have at least one door, at least 90 cm wide, opening outwards by means of push-bar.

Classrooms with more than 100 people should have at least two doors, at least one 120 cm wide, opening outwards by means of push-bar. In general one door, 120 cm wide, opening outwards by means of push-bar, is needed for every 100 people or part thereof .

6.2 Sports halls, multipurpose halls, auditoriums, cinemas, theatres, restaurants

All rooms that can be used as sports halls, multipurpose halls, auditoriums, restaurants or similar, exceeding 100 people, should have at least 2 exits, in opposite positions, at least 120 cm wide.

Exits should be preferably independent from the egress system of the school.

At least one additional exit is required for every additional 100 people or part thereof.

6.3 Laboratories

Laboratories with less than 50 people should have at least one exit, at least 90 cm wide, opening outwards, with an EN 179 handle or a push-bar.

Laboratories with more than 50 people should have at least two exits, each at least 90 cm wide, possibly in opposite positions. Doors must have push-bars.

Please refer to CFP-A-E Guideline no. 28:2012 F, "Fire safety in laboratories".

6.4 Floor exits

In general, any floor with more than 50 people should have at least two different exits, if possible in opposite positions. If the two exits lead to a single stair, then the stair should be at least protected. All basements, which have more than one classroom, must have at least two exits.

Where possible, each fire compartment and each floor should have at least two exits.

Horizontal egress paths and doors should be at least 90 cm wide, with door opening outwards and with EN 179 handles. In all floors where there are more than 100 people, all doors along egress routes should be at least 120 cm wide, opening outwards by means of push-bars.



All doors along egress routes should open outwards with a push-bar if more than 50 people use the door for egress.

One way egress paths exceeding 20 m should be avoided.

The maximum distance between the door of any classroom to the nearest protected stair, or to the nearest smoke-free stair, or to the external area should not exceed 50 m. In case of a one-way egress path, the distance from the classroom door to the point in which it is possible to go to different directions is to be considered as double, and then added the distance from that point to the stair or to the external area, the maximum being 50 m.

If some of the requirements above is not possible, then a specific risk assessment should be made.

All exits must always be kept free from obstacles, internally and externally, with clear signage. The signage should if possible be by illuminated signs, powered by normal electric supply, and also by emergency electric supply.

All exits cannot be locked and must be openable without keys or other tools when there are people inside the premises.

6.5 Stairs

In type 2 schools with more than two floors above ground, all stairs should be at least protected.

In type 3 schools with more than two floors above ground, all stairs should be smoke proof.

In all cases above, if the buildings is less than 12 m tall, one single open stair (=not protected, not smoke-proof) can be considered as a fire exit.

Egress stairs in buildings taller than 12 m should be at least protected.

Egress stairs in buildings taller than 24 m should be smoke proof.

All stairs should be straight and steps should be rectangular. The maximum step rise should be 17 cm and the minimum step thread should be 30 cm.

If steps are not rectangular, like for example in spiral stairs, the steps should be 30 cm wide, measuring at 40 cm from the narrower part of the step.

The stairs should have maximum 15 steps between two landings.



Stairs larger than 240 cm should have a central handrail.

Steps should have anti-slip strips, and at least one handrail. If the handrail works as a parapet, it should be installed at least 110 cm from floors or the center of steps. In case of young students or people with disabilities, it can be appropriate to install an additional handrail at a lower level.

Handrails must not reduce the width of the stair. Handrails protruding less than 8 cm can be excluded.

Stairs to the basement should be separated by stairs to upper floors by means of fire resistant structures, with a fire resistance of at least 60 minutes.

If some of the requirements above are not possible, then a specific risk assessment should be made.

In general and when not otherwise specified by national or local codes, one 120 cm stair can be considered sufficient for 100 people at each floor.

6.6 Final exits

Final exits must never be locked or blocked by external obstacles, like for example parked cars or snow.

The external face of a final exit should have a signage such as "Fire exit – do not block".

6.7 People with disabilities.

Often in schools, there are people with disabilities, and their evacuation can be difficult.

In general:

- A normal lift must never be used for the evacuation of people, including people with disabilities;
- buildings taller than 24 m should have an evacuation lift;
- at each floor, at least one refuge for disabled people must be present.

Secure waiting areas are not needed at ground floor(s).

Please refer to CFP-A-E Guideline no 33:2015 F "Evacuation of people with disabilities".

6.8 Assembly point

An assembly point out of the building must be determined. If possible, proper signage should be installed.

The assembly point must be indicated in the evacuation plans.



It should be noted that the assembly point must be sufficiently large and must be on firm ground, far from possible hazards like for example gas pipes, electric power lines, rivers, lakes and beaches, possible landslides, possible avalanches.

The assembly point must be separated from the footprint for fire-fighting vehicles.

Where possible, for each classroom the teacher is responsible for the roll call in order to verify that all people safely got out of the building. If somebody is missing, the teacher must immediately report it to the fire fighters.

6.9 Schools for people with disabilities

Schools specifically established for people with disabilities should have an egress system designed specifically considering all possible disabilities.

If the school includes floors other than ground floor, there must be at least 2 different stairs, each with one secure waiting areas, each one with enough space for all occupants with disabilities.

The automatic fire and alarm system must take into consideration all possible disabilities, and must guarantee that all people in the building are able to be properly notified of an alarm, such as optical alarms, acoustical alarms, vibrating devices, or by means of a sufficient number of trained personnel.

The position of manual call points, extinguishers and other systems or devices useful in case of fire must be designed considering all possible disabilities. For example, if considered as appropriate by the fire risk assessment, the installation of these devices should be at a certain height from floor (normally about 80 cm from floor), in order to guarantee that all people can use them.

The emergency exits must never be locked, except in extremely particular cases, like for example in schools for mentally disabled people, and only as a result of a specific fire risk assessment carried out by a qualified fire engineer. In this case, all personnel must be adequately trained and must have a key or other affordable device that must guarantee the immediate and simultaneous opening of all emergency doors.

Signage and communication systems must be designed specifically considering all possible disabilities.

Please refer to CFPA-E Guideline no. 33:2015 F, "Evacuation of people with disabilities".

7 Technical fire protection

7.1 Technical systems

All technical systems (electric system, HVAC, etc.) must be designed, installed and maintained following the applicable national or local regulations.



7.2 Fire detection and alarm system

In all schools, a fire detection and alarm system has to be designed, installed and maintained according to national or local regulations.

A fire alarm system can inform all users of the building at an early stage of fire and can alert the fire department in a short space of time. This is especially useful rooms that are not used permanently, such as storerooms and basements.

Normally smoke detectors are suitable, but particular rooms like kitchens and laboratories may require different kind of sensors.

Alarms should be optical and acoustic; the sound must be clearly audible in all rooms, with a sound level sufficient to cover all possible background sounds.

Special devices, such as vibrating devices, optical and/or acoustical alarms, may be necessary for those with a disability.

The activation of the fire detection system should immediately stop the fans of the HVAC system (if present).

Schools with over 1000 people should have an EVAC system according to EN ISO 7240-19.

7.3 Fire extinguishers

All schools should have a sufficient number of fire extinguishers. In general, water based extinguishers are preferable, as they are easy to use and do not lower the visibility when used.

Extinguishers should be at least 34A-144B, at least one every 100 sqm, at least one at each floor. At least one extinguisher is needed in or immediately outside all high-risk areas.

7.4 Water hose systems

Type 2 and 3 schools, and schools with levels below – 5 m or over + 24 m should have a fixed water hose system, designed, installed and maintained following the applicable national or local regulations.

7.5 Emergency light

All schools should have an emergency lighting system, designed, installed and maintained according to the applicable national or local regulations.

In general, there should be at least:

- one light in every classroom;
- lights along corridors and stairs;
- lights inside offices, laboratories, kitchens, sports halls, multipurpose halls, auditoriums;



- one light near the general electric panel;
- at least one light inside all refuge areas for disabled people;
- external lights from the final doors to the public road, when appropriate, depending on the specific configuration of the premises.

The system should guarantee at least 5 lux along egress routes, to be measured horizontally at 1 m from floor.

If needed according to the fire risk assessment, in laboratories the emergency light system should guarantee higher levels of illuminance.

7.6 Smoke ventilation

All rooms should have a system to guarantee the evacuation of smoke and heat during a fire. In general, normal windows can be sufficient; general criteria may be to have natural ventilating net surfaces for a total of at least 1/40 of floor surface.

Rooms with a fire load exceeding 1200 MJ/sqm should have a specifically designed ventilation system.

In case of mechanical extraction systems, a sufficient air inlet must be provided; fans and ducts should be fire resistant according to the risk assessment results.

If some of the requirements listed above are not possible, then a specific risk assessment should be made.

7.7 Other fixed fire safety systems

When required by a specific fire risk assessment, for example in particular rooms like laboratories or other high risk areas, other fixed fire safety systems can be necessary, like for example carbon monoxide (CO) detectors or fire blankets.

When required by a specific fire risk assessment, for example in particular rooms like stock rooms, laboratories, covered car parks, etc., a sprinkler system should be designed, installed and maintained following the applicable national or local regulations.

7.8 Safety signage

Appropriate signage is required for fire extinguishers, fire hoses, egress routes and exits.

Signage must conform to EN ISO 7010 standard or national regulations.

Illuminated or translucent exit pictograms in corridors and staircases guarantee better visibility than normal signage, especially during the night and in case of smoke, and may improve emergency egress significantly.



Illuminated signage need an emergency power supply for at least 60 minutes.

7.9 Lifts

Schools taller than 24 m should have an evacuation lift.

All lifts, excluding evacuation lifts where present, should have an automatic emergency lowering system.

8 Organizational fire protection

Please refer to Guideline no. 1: 2015 F "Fire protection management system".

8.1 Arson

Arson is a major fire problem in schools, particularly in secondary schools.

Basement, roofs and toilets are among the most common places where a fire can be started intentionally.

Security against unauthorized accesses, particularly during nighttime, such as alarms for windows, doors and smoke vents on roofs, is an important part of the fire safety of schools.

Please refer to CFPA-E Guideline no. 2:2016 S "Security in schools".

When not in use, laboratories and high-risk areas should be kept locked.

All external combustible material, in particular external garbage containers and trash bins, should be installed at a sufficient distance from the building and, if possible, should be firmly fixed in order to prevent them from being lifted or moved (please see point 8.8).

Please refer to:

- CFPA-E Guideline no. 1:2010 S "Arson document";
- CFPA-E Guideline no. 8:2016 S "Security in schools".

8.2 Maintenance works, hot works

In all schools, a hot work permit system must be adopted. Before all works, the fire risk assessment needs to be updated.

All hot works should be performed in accordance to CFPA-E Guideline no. 12:2012 F "Fire safety basics for hot work operatives".



8.3 Emergency and evacuation plan.

An emergency and evacuation plan needs to be adopted. The plan must be simple to implement in case of emergency.

At least one drawing, in plain sight, must be installed on a wall to show the main plan or characteristics of the school, including:

- The position of emergency exits;
- The position of main fire extinguishing systems and devices;
- The position of the main safety devices like for example gas shutters, emergency electric general switch, Fire fighters water connection, etc.
- The assembly point;
- All secure waiting areas;
- The main emergency telephone numbers.

The number of drawings must be adequate for the dimension of the school.

The drawing(s) must be easily to understand and must be installed on the wall with proper orientation.

Among teachers and school personnel, excluding students, a sufficient number of people must be adequately trained to form an internal fire service.

Please refer to CFPA-E Guideline no. 25:2010 F "Emergency plan".

8.4 Training plans and fire drills

Teachers, students and other personnel must be trained in fire procedures, earthquake procedures (when applicable) and egress, by means of periodical fire drills.

Fire drills need to be performed regularly, at least once a year. If the drills reveal that the emergency and evacuation plans have a defect, it must be corrected as soon as possible and, following that, another fire drill must be organized and undertaken.

8.5 Smoking

Smoking is forbidden inside all schools.

External smoking areas can be established, but in this case all materials, including canopies (if present), need to be non-combustible. The floor needs to be plain, easy to clean, without any cracks or gaps, so that it is impossible for cigarette butts to end up in a space under the floor.

8.6 Maintenance and cleanliness

All systems, including all fire safety systems, must be regularly maintained.



All schools must have a cleanliness procedure with regular periodical cleaning of all spaces, including external spaces, risers, voids, and all areas where dust and waste can accumulate during time.

8.7 Flammable liquids and gases

Flammable liquids and gases must be kept in the minimum necessary quantities. They must be stored in accordance with national or local regulations.

Large amounts of flammable liquids or gases must be kept in a specific fire compartment, possibly with direct access from outside, with appropriate ventilation, and a specific explosion risk assessment must be done.

8.8 Dangerous substances and chemicals

Dangerous substances or mixtures, for example cleaning agents, must be kept in a safe location in their original packaging locked if possible, with all original labels containing written safety instructions according to national codes attached. Preferably, bottles of cleaning agents or dangerous products should have children-safe closures.

All cleaning agents and other dangerous substances must never be inserted in other bottles or containers, especially in bottles that have been used for drinking liquids or that are similar to bottles of drinking liquids. Inattentive people and children can easily mistake those bottles or containers as a drink, which if they were to subsequently drink from the bottle or container may cause severe injuries may or even death.

8.9 Waste management and disposal

Clear instructions must be given to students and personnel concerning correct waste management and disposal and possible correct methods of recycling of waste indicated by local codes.

Accumulation of waste should be avoided.

Any waste containers that are placed outside the premises must have an adequate safety distance away from the premises to prevent arson or accidental combustion. The minimum horizontal safety distance between buildings and waste containers, smaller than 600 l, is 2,5m. For larger waste containers see more detailed information in CFPA-E guideline No 7 F Safety Distances Between Waste Containers and Buildings.



9 European guidelines

Fire

- Guideline No 1:2015 F -Internal fire protection control
- Guideline No 2:2018 F -Panic & emergency exit devices
- Guideline No 3:2011 F -Certification of thermographers
- Guideline No 4:2010 F -Introduction to qualitative fire risk assessment
- Guideline No 5:2016 F -Guidance signs, emergency lighting and general lighting
- Guideline No 6:2021 F -Fire safety in care homes
- Guideline No 7:2011 F -Safety distance between waste containers and buildings
- Guideline No 8:2004 F -Preventing arson – information to young people
- Guideline No 9:2012 F -Fire safety in restaurants
- Guideline No 10:2008 F -Smoke alarms in the home
- Guideline No 11:2015 F -Recommended numbers of fire protection trained staff
- Guideline No 12:2012 F -Fire safety basics for hot work operatives
- Guideline No 13:2006 F -Fire protection documentation
- Guideline No 14:2019 F -Fire protection in information technology facilities
- Guideline No 15:2012 F -Fire safety in guest harbours and marinas
- Guideline No 16:2016 F -Fire protection in offices
- Guideline No 17:2014 F -Fire safety in farm buildings
- Guideline No 18:2013 F -Fire protection on chemical manufacturing sites
- Guideline No 19:2009 F -Fire safety engineering concerning evacuation from buildings
- Guideline No 20:2012 F -Fire safety in camping sites
- Guideline No 21:2021 F -Fire prevention on construction sites
- Guideline No 22:2012 F -Wind turbines – Fire protection guideline
- Guideline No 23:2010 F -Securing the operational readiness of fire control system
- Guideline No 24:2016 F -Fire safe homes
- Guideline No 25:2010 F -Emergency plan
- Guideline No 26 -Unfilled
- Guideline No 27:2021 F -Fire safety in apartment buildings
- Guideline No 28:2012 F -Fire safety in laboratories
- Guideline No 29:2019 F -Protection of paintings: transports, exhibition and storage
- Guideline No 30:2021 F -Basic principles of fire safety of historic buildings
- Guideline No 31:2021 F -Protection against self-ignition and explosions in handling and storage
-of silage and fodder in farms
- Guideline No 32:2014 F -Treatment and storage of waste and combustible secondary raw
-materials
- Guideline No 33:2015 F -Evacuation of people with disabilities
- Guideline No 34:2015 F -Fire safety measures with emergency power supply
- Guideline No 35:2015 F -Fire safety in warehouses
- Guideline No 36:2017 F -Fire prevention in large tents
- Guideline No 37:2018 F -Photovoltaic systems: recommendations on loss prevention

Natural hazards

- Guideline No 1:2012 N -Protection against flood
- Guideline No 2:2013 N -Business resilience – An introduction to protecting your business



- Guideline No 3:2013 N -Protection of buildings against wind damage
- Guideline No 4:2013 N -Lighting protection
- Guideline No 5:2020 N -Managing heavy snow loads on roofs
- Guideline No 6:2016 N -Forest fires
- Guideline No 7:2018 N -Demountable / Mobile flood protection systems

Security

- Guideline No 1:2010 S -Arson document
- Guideline No 2:2010 S -Protection of empty buildings
- Guideline No 3:2010 S -Security systems for empty buildings
- Guideline No 4:2010 S -Guidance on keyholder selections and duties
- Guideline No 5:2012 S -Security guidelines for museums and showrooms
- Guideline No 6:2014 S -Security guidelines emergency exit doors in non-residential premises
- Guideline No 7:2016 S -Developing evacuation and salvage plans for works of art and heritage buildings
- Guideline No 8:2016 S -Security in schools
- Guideline No 9:2016 S -Recommendation for the control of metal theft
- Guideline No 10:2016 S -Protection of business intelligence
- Guideline No 11:2018 S -Cyber security for small and medium-sized enterprises