

CEN/TC 10 N 528

Item 12.5.1

Safety rules for the construction and installation of lifts — Particular applications for passengers and goods passenger lifts — Part 76: Evacuation of disabled persons using lifts

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Foreword

This document (prCEN/TR 81-76:2006.2) has been prepared by Technical Committee CEN/TC 10 "Ascenseurs", the secretariat of which is held by AFNOR.

This document is a working document.

It represent the first step of a necessary cooperation with the CEN TC 127 on the subject (Resolution CEN TC 10 Saint Denis 014/2005)

Introduction

This document is a type C standard as stated in EN ISO 12100-2:2003.

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

When provisions of this type C standard are different from those which are stated in type A or B standards, the provisions of this type C standard take precedence over the provisions of the other standards, for lifts that have been designed and built according to the provisions of this type C standard.

At present there are no European and only few national regulations for lifts which include specifications related to the evacuation from buildings of persons with impaired mobility using lifts

This has the consequence, that persons with impaired mobility may experience difficulty and delay during evacuation.

Approach of this Technical report

Lift regulation applicable to new lifts already now take into account accessibility to lifts for all, including persons with disability.

The European standard EN 81-70 defines the state of the art for accessibility by using lifts for vertical travel.

Today in Europe, except in some rare specific cases, lifts are never used as a mean to evacuate they are removed from service in case of emergency or if not the instructions are to never use them in such situation.

This situation is not very coherent, often the lift is the only way of allowing a disabled person to access to a defined building level. It should also allow the same person, in the majority of cases to leave a level in case of an emergency with or without depending on the assistance of other occupants or rescue services.

Actual situation in Europe concerning evacuation

Fire regulations in buildings are not harmonized, they can differs

- from country to country
- depending of the building type

Evacuation, firefighting concepts and fire management can also be different. Some points seem to be common:

- In a building, horizontal and vertical circulations (corridors and stairs) are dimensioned in number and in width in a way to allow building evacuation in a time defined in accordance with the applicable regulation.
- Lifts are rarely considered as a way to escape in case of evacuation
- The rule is "In case of emergency don't use lifts, use evacuation exits"

- This rule is communicated in different means to all building occupants
 - Signs
 - Signalisation
 - Audible message
 - Training
 - Evacuation exercise
 -

In some particular cases and under particular conditions in some countries, some lifts can be used for transportation of disabled in case of emergency

In office buildings and buildings where the public may enter, hotel etc, personnel are often appointed responsible for a particular level. These are called "fire assistants" or "fire wardens" . Their task is to;

- Verify in case of evacuation alert that all rooms of the concerned level have been effectively evacuated.
- Help disabled people and particularly people with impaired mobility to evacuate by using stairs.

Basic principle of the evacuation of disabled taken in account in this document

The principle that a lift is not a way to escape for ambulant persons is not modified.

The purpose of this document is not to reconsider this principle, but to study under which conditions lifts could be used in order to assist the evacuation of persons with impaired mobility

These lifts will be lifts normally used for the daily vertical transportation but with special function used in case of evacuation.

This technical report highlights the building requirements to be satisfied in order to be able to implement such an "evacuation lift"

This document describes only a simple "evacuation lift" in order to provide a reasonable and practical solution suitable for implementation in low and mid rise buildings such as offices, shopping centres, hotels, residences etc....

In more sophisticated cases like high-rise buildings, hospitals, houses for retired people, buildings with permanent fire-fighters, etc a more sophisticated approach has to be taken for the evacuation, the design of such lift is not defined in this document.

Target of the document

This Technical report deals with:

- a) the reduction of risks to persons with impaired mobility during a building evacuation
- b) the reduction of risk to passengers in the lift car that may be exposed to fire and smoke.

- c) the reduction of the risk of passengers being trapped in a car during an evacuation;

Use of this technical report

The purpose of this report is to show how the lifts can be adapted in order to be used for evacuation and to list all the requirements not directly depending of the lift itself, but which have to be satisfied in order to make this use practicle and safe

This Technical report can be used as a guideline for:

- a) national authorities to determine its own programme of implementation
- b) owners to follow their responsibilities according to existing regulations
- c) as a basis for future national /European standards on this subject.

1 Scope

1.1 Use of the lift

This Technical report gives rules for the intended use of the lift by persons with impaired mobility in order to assist the evacuation of a building

It specifies the special provisions and safety rules to assist persons with impaired mobility to safely evacuate a building using lifts with authorized assistance.

1.2 This Technical report applies :

to permanently installed :

- electric lifts, with traction or positive drive (as defined in EN 81-1);
- hydraulic lifts (as defined in EN 81-2)

serving defined landing levels, having a car designed for the transportation of persons or persons and goods and moving between guide rails inclined not more than 15° to the vertical.

1.3 This Technical report does not apply to:

- i) where structural damage to the building has been incurred e.g. explosion, flood, lightning strike, earthquake, storm damage etc.
 - ii) a fire in the well
 - iii) the use of lifts for the evacuation of fully ambulant persons
- requirements for the fire resisting structure of the building.

However, this Technical report may usefully be taken as a reference.

1.4 Assumptions

The following assumptions were made:

- 1) The requirements apply to all passenger and goods passenger lifts with electric and hydraulic drives defined in the EN81:1 and EN 81:2;
- 2) Evacuation lifts are not seen as the primary means of evacuation and are only intended for use by persons with impaired mobility;
- 3) **Persons with impaired mobility will be evacuated with the help of specially trained persons with the physical ability to assist those persons who require assistance ,**
- 4) The alarm and fire detection systems are operating as intended;
- 5) The lift(s) is appropriate for the intended purpose e.g. evacuation of wheelchairs, beds, stretchers, walking aids etc.;
- 6) An safe area is provided adjacent to the lift for persons to wait in safety e.g. protected lobby etc:
- 7) Any flooding from within the building into the lift (e.g. sprinkler discharge, burst pipes, fire hose etc.) does not impair the use of the lift;
- 8) The lift(s) is on normal service and is operating correctly;
- 9) The lift is properly maintained;
- 10) ISO/TS 14798 was used as the risk assessment methodology.
- 11) Negotiations have been made between the owner/customer and installer concerning:
 - the intended use of the lift;
 - the building evacuation strategy;
 - the design of the lift fulfilling the requirements of the evacuation strategy e.g. attendant control with signalling (enunciator) system, out-of-service indicator, automatic doors etc.
 - environmental conditions;
 - civil engineering problems; and
 - other aspects related to the place of installation.

NOTE: Developers and architects will need to take account of National Building Regulations.

1.5 Consideration of type of disability

EN 81-70 covers different kind of disabilities (see EN 81-70:2003, Table B.1).

Considering that not all people with disabilities need a lift in order to evacuate a building this report deal principally with the use of lift for evacuation of people with impaired mobility:

- iv) wheel chair users,
- v) ambulant disabled (persons using walking stick, crutches, walking frame, rollator),

- vi) women in late stage of pregnancy,
- vii) persons in the building with injuries (sports or any other activity) ,
- viii) persons injured as part of the emergency
- ix) person who enter in the building with assistance of an other person
- x)

It includes all person needing actually to be carried by other occupant or by trained personnel through the stair cases in case of evacuation.

1.6 Non-consideration of type of disability

EN 81-70 doesn't cover combinations of different kind of disabilities (see EN 81-70:2003, Table B.2)

But for evacuation of person, when this evacuation is assisted, then all disabled can be evacuated using lifts.

1.7 Type of evacuation being considered

This document consider only the evacuation using the lift for persons with impaired mobility by specially trained person (assisted evacuation).

As soon as fire-fighters arrive on site they will determine the most convenient way to continue the evacuation if necessary.

2 Normative references

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

EN 54-1:1996, *Fire detection and fire alarm systems — Part 1: Introduction.*

EN 54-2:1997, *Fire detection and fire alarm systems — Part 2: Control and indicating equipment.*

EN 81-1:1998, *Safety rules for the construction and installation of lifts — Part 1: Electric lifts.*

EN 81-1:1998/A1:2006, *Safety rules for the construction and installation of lifts – Part 1: Electric lifts.*

EN 81-1:1998/A2:2004, *Safety rules for the construction and installation of lifts – Part 1: Electric lifts.*

EN 81-2:1998, *Safety rules for the construction and installation of lifts — Part 2: Hydraulic lifts.*

EN 81-1:1998/A1:2006, *Safety rules for the construction and installation of lifts – Part 1: Electric lifts.*

EN 81-2: 1998/A2:2004, *Safety rules for the construction and installation of lifts – Part 2: Hydraulic lifts.*

EN 81-70:1999, *Safety rules for the construction and installations of lifts - Part 70: Particular applications for passenger and good passenger lifts - Accessibility to lifts for persons including persons with disability.*

EN 81-72:2003, *Safety rules for the construction and installation of lifts – Part 72: Firefighters lifts.*

EN 81-73, *Safety rules for the construction and installation of lifts - Particular applications for passenger and goods passenger lifts - Part 73: Behaviour of lifts in the event of fire.*

ISO 3864-1:2002, *Graphical symbols - Safety colours and safety signs - Part 1: Design principles for safety signs in workplaces and public areas (Note: Corrected and reprinted in 2003-12)*

ISO 8421-3:1989, *Fire protection — Vocabulary — Part 3: Fire detection and alarm.*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN ISO 12100-2:2003, EN 54-1:1996; EN 54-2:1997; EN 81 series of standards and the following apply.

3.1

Impaired mobility person

Impaired mobility in the sense of this standard, means difficulties in using stairs because of physical impairment.

For example this definition include:

- Wheelchair users,
- Disabled people who are able to walk but who may depend on prostheses (artificial limbs), sticks, crutches or walking aids,
- Heavily pregnant, fat people, elderly people

3.2

evacuation lift

lift that may be used for the evacuation of persons with impaired mobility in case of emergency, under the direction of building management or , rescue services.

3.3

safe area

area on a floor of a building where it is known that heat, smoke, etc...are not present and where it will be safe for people to wait, exit or enter a lift car, in this document such area will be defined as a "refuge".

3.4

building evacuation strategy

Arrangements that have been put in place and documented for the evacuation of the building

4 List of significant hazards

This clause contains all the significant hazards, hazardous situations and events, as far as they are dealt with in this standard, identified by risk assessment as significant for this type of lift and which require action to eliminate or reduce risk.

4.1 Significant hazards

Significant hazard dealt with in this technical report are shown in the Tables 1 and 2 below:

Table 1 — List of significant hazards and hazardous situations – Environment

Significant Hazards and Hazardous situations - Environment		Information in this standard
1	Flooding inside building	1.4 7) _
2	Fire outside of the well of the lift	5.4 c) _
3	Not having enough lift for evacuation	5.5.1
4	Smoke or high temperature in the waiting area (No safe space for disabled waiting for evacuation)	5.5.2 _ 5.5.2.1 _ 5.5.2.2 _ 5.5.2.3 _ 5.2.2.4 _ 5.5.2.7
5	Difficulty to find the refuge	5.5.2.5
6	Entrapment (Disabled "forgotten" in the refuge)	5.5.2.6
7	Asphyxiation (Smoke or high temperature in the shaft during evacuation)	5.5.3

Table 2 — List of significant hazards and hazardous situations – evacuation lift

EN 1050	Significant Hazards and Hazardous situations according to EN1050 for the evacuation Lift,	Requirements and clauses in this standard
1.5	Entrapment	5.10
8.6	Human error	5.11.3 5)
8.7	Inadequate design, location or identification of manuals controls	5.9.1
8.8	Bad positioning of the display	5.8.2.1 _ 5.8.2.2 _ 5.9.1 _ 5.9.2

4.3 The following significant hazards are not dealt with in this technical report (for information see Introduction):

- a) Insufficient or incorrectly located evacuation lifts
- b) entrapment in waiting area due to absence of lift service or adjacent stairs;
- c) a fire in the evacuation lift well, waiting area , machinery space or lift car;
- d) structural collapse before the evacuation has been completed using lifts;

5 Requirements for the use of lift for evacuation of persons with impaired mobility and/or protective measures

5.1 Lift size and equipment

In order to be used for evacuation of disabled the lift must comply with the requirements of EN 81-70, EN 81-72 and EN 81-73.

NOTE

- a) It's possible to start to think about evacuation of disabled only if these disabled have been able to access to the building, so the lift must be firstly in accordance with EN 81-70.

But it is possible however that persons

1. have been injured during the emergency and may no longer be able to use stairs etc that were used on entry. This may mean that at least one lift should be able to take a stretcher?
2. not able to use a lift alone have been accompanied inside the building

- b) Function of the EN 81-73 will be used at the beginning of the evacuation mode in order to allow users to leave the car.

- c) EN 81-72 is also mandatory its requirements being essential for the use of the lift in evacuation. Protected lobby

- Fire-fighters service (when the fire-fighters will arrive on site)
- Emergency trap door in car
- Speed of the lift
- Water protection
- Secondary electrical supply

- d) However where the building evacuation strategy does not require that this lift has to work as a fire-fighters lift (because others fire-fighters lifts are at disposal of the firemen in the building) the provision of the fireman switch (5.8.1 of EN 81-72) is not required.

5.2 Fundamental "evacuation lift" requirements

An evacuation lift will be provided with additional controls and signals.

5.3 Control systems

5.3.1 Input signal

The lift shall operate in accordance with **5.7** on receipt of an electrical signal.

The electrical signal shall be provided either by an automatic fire detection and alarm system or a manual device.

This signal is the "evacuation mode" signal.

Where a manual device to initiate the evacuation mode is provided, it shall be:

- a) bi-stable in operation and
- b) clearly marked such to avoid any error about its position and
- c) appropriately marked for its purpose and
- d) located in the management centre of the building or at the main designated floor and
- e) when accessible to all, protected from misuse e.g. by placing it behind a glass panel or located within a secure area.

NOTE The decision as to whether an automatic fire detection system or manual recall device is selected is the subject of negotiation at the design/planning stage of the building.

5.3.2 Interface requirements between the fire alarm system and the lift control system

Interruption of interface connection shall initiate the evacuation mode function of the lift as described in **5.7**.

NOTE The type of interface shall be at the choice of the lift installer in negotiation with the building owner (see EN 81-1:1998, 0.2.5 and EN 81-2:1998, 0.2.5).

Examples of interfaces which may be used are shown below.

5.3.2.1 Discrete interface

A discrete interface shall be realised by normally open-contacts (voltage free) which open in the evacuation demand.

Contacts providing voltage free signals to the lift control system shall be provided by the supplier of the automatic fire detection system.

Where required, contacts providing output signals (e.g. lift status) shall be provided by the lift installer.

5.3.2.2 Serial interface

Serial interface shall be fail safe and realised by the transmission of information in the form of serial signals, in accordance with a standardised software/hardware protocol (e.g. EIA-422-A or ITU-T V.11).

5.4 Landing equipment

5.4.1 Pictogram

At each landing a pictogram shall be displayed on the frame of the lift landing door (or on the landing call box if there is no possibility to confuse with an other lift), see **Figure 1**

The size of the pictogram shall be at least 50 mm.



Illustration in white

Background in blue

NOTE The following text may be added in the local language to the pictogram. "Lift for evacuation of disabled".

Figure 1 — Pictogram "Evacuation lift"

5.4.2 Landing signalisation

5.4.2.1 Disabled evacuation

Above each landing door between 1.8 m and 2.5 meter from the ground a luminous signalisation will be installed.

This signalisation will be displayed in blinking mode during evacuation

The signalisation shall be a pictogram shall be at least 50 mm.



Illustration in white

Background in blue

Figure 2 — Signalisation "Disabled evacuation"

5.4.2.2 Non-Stop

During evacuation, if following the local regulation the lift is equipped with a "Non-Stop" function at the level in case of fire the pictogram of the signalisation described in 5.4.2.1 will be replaced by a pictogram informing

the "fire assistant" that they will have to move the disabled one level down using the stairs in order to be able to do the evacuation by lift.



Same illustration than for "disabled evacuation" but with the forbidden logo

Figure 3 — Signalisation "Non stop during disabled evacuation"

5.5 Car Equipment

5.5.1 Priority contact

In case of evacuation under the control of an attendant (see 5.7.1) a key switch contact "priority in car" will be located in the car operating panel at the height of the alarm button and door reopen button or above it. This contact shall be marked with "priority" and the '0' and '1' positions shall be clearly indicated. The key shall only be removable in the '0' position.

5.5.2 By Pass button

In case of evacuation without the control of an attendant (see 5.7.1) A special button "By Pass" will be located in the car operating panel at the height of the alarm button and door reopen button or above it.

This button should be in accordance with EN 81-70 Table 2.

The button must be marked with the evacuation pictogram (see Fig. 3)



Illustration in white

Background in blue

Figure 3 — Pictogram "By-pass button"

5.5.3 Car signalisation

In the car a luminous signalisation will be installed. This signal shall be located within or above the car operating panel. The centreline of the indicator shall be positioned between 1,60 m and 1,80 m from the car floor. The height of the pictogram shall be between 30 mm and 60 mm.

This signalisation will be displayed in blinking mode during evacuation

The signalisation shall be the same signalisation with the same pictogram than defined for landing signalisation in 5.4.2.1 Fig.2

5.6 Car communication system

5.6.1 An evacuation lift shall have an intercom system or similar device for interactive two way speech communication, whilst the lift is in Phases 1 and 2, between the evacuation lift car and the exit level

5.6.2 The communication equipment within the lift car and at the exit level shall be a built-in microphone and speaker, and not a telephone handset.

5.6.3 The wiring for the communication system shall be installed within the lift well.

5.6.4 If the exit level is the fireman level the communication system can be the same than the communication system required in the 5.12 of the EN 81-72

5.7 Behaviour of the lift on the receipt of an evacuation signal

When an emergency is detected the building management (or in some case the fire detection system following national regulation) will initiate the audible "evacuation signal" in the building.

This evacuation signal can be a bell or a vocal message depending of the national regulation applicable.

Note: Following national regulation this audible signal can be completed by a visible signal

At the same time a signal is sent to the lift control:

- a) If the lift is not "an evacuation lift" this signal is the signal defined in the EN 81-73 and will initiate the automatic return of the lift at the designated floor and will put the lift "out of service" at this level as defined in the EN 81-73
- b) If the lift is an "evacuation lift" the lift will function as defined in 5.7.1

5.7.1 Principle of the function of the lift in evacuation mode

Depending of the building evacuation strategy (see **Annex A**) 2 types of evacuation of disabled persons with impaired mobility can be realised (the choice of this strategy has to be determined when the lift is specified and ordered to its supplier)

- 1) Evacuation under the control of a "fire assistant" who controls the lift as an attendant (lift driver),
- 2) Self evacuation without lift attendant (automatic collective control), or assisted if required by the "fire assistants" appointed at each level.

5.7.1.1 Evacuation under control of a lift attendant

The principle of the function of the lift in the evacuation mode is:

- To return the car to the designated landing and allow any passengers to exit (function of the EN 81-73) and stand at this level door open.
- To allow an attendant to take the control of the lift by the use of a priority key in the car
- To inform users that the use of the lift is reserved for the evacuation of disabled.
- The evacuation mode is normally stopped at the fire-fighters arrival when they switch the lift in fire-fighters mode.

5.7.1.1.1 Phase 1

As soon as the evacuation signal has been transmitted:

- 1) Valid occupants and disabled persons without impaired mobility will evacuate following the fire escape routes determined by the building management, without using the lifts. (see **annex A**)
- 2) The lift will return to the designated floor according to the function defined in EN 81-73 and stands at this level with the doors open.

5.7.1.1.2 Phase 2

- 1) Once at the designated return floor the evacuation lift will automatically switch in "evacuation mode" and keep the door open.
- 2) At all levels the signalisation defined in **5.4.2.1** start to blink .
- 3) In the car the signalisation defined in **5.5.2** start to blink
- 4) Landing call are disconnected
- 5) Car calls are allowed as soon as the "fire assistant" who has the function of lift attendant switches the priority contact in the car for the assisted evacuation of disabled persons
- 6) During the function of the lift in "evacuation mode" phase 2

- it shall not be possible to register more than one car call simultaneously;
- whilst the car is in motion, it shall be possible to register a new call from within the car. The previous call shall be cancelled. The car shall travel in the shortest time to the new registered floor;
- registration of a car call shall cause the lift car to travel to, and stop with the doors remaining closed at, the selected floor;
- if the car is stationary at a landing, it shall be possible to control the opening of the doors only by the application of constant pressure on the 'door open' car button. If the 'door open' car button is released before the doors are fully open, the doors shall automatically re-close. When the doors are fully open, they shall remain open until a new call is registered on the car control panel;
- door reversal devices that may be affected by smoke or heat, shall be rendered inoperative, the other car door reversal devices and the door open button, shall remain operative.
- the registered car call shall be visually displayed on the car control panel;
- the position of the car shall be shown when the normal or emergency power is available, both in the car and at the fire service access level;
- the lift shall remain at its destination landing until a further car call is registered;
- the fire service communication system as defined in 5.12 shall remain operative during Phase 2;
- the voice link between the car and the building management desk (or fireman level) is established (see 5.6.1)

5.7.1.2 Evacuation without control of a fire attendant

- The principle of the function of the lift in the evacuation mode is:
- To return the car to the designated landing and allow any passengers to exit (function of the EN 81-73).
- To return the lift in service with landing and car buttons operative for the use of the lift by trained persons ("fire assistants") in order to help the evacuation of persons with impaired mobility
- To inform users that the use of the lift is reserved for the evacuation of disabled.
- The evacuation mode is normally stopped at the fire-fighters arrival when they switch the lift in fire-fighters mode.

5.7.1.2.1 Phase 1

As soon as the evacuation signal has been transmitted:

- 3) Valid occupants and disabled persons without impaired mobility will evacuate following the fire escape routes determined by the building management, without using the lifts. (see **annex A**)
- 4) The lift will return to the designated floor according to the function defined in EN 81-73.

5.7.1.2.2 Phase 2

- 7) Once at the designated return floor the evacuation lift will automatically switch in "evacuation mode" and close this door.
- 8) At all levels the signalisation defined in **5.4.2.1** start to blink .
- 9) In the car the signalisation defined in **5.5.2** start to blink
- 10) The lift can now answer normally to landing and car calls for the assisted evacuation of disabled persons
- 11) In case of full collective control only landing calls in the direction of the evacuation floor are accepted.
- 12) During the function of the lift in "evacuation mode" phase 2
 - a. a pressure on the "by-pass" described in **5.5.1** will allow the person helping a wheel chair user to by-pass others landing call if the surface of the car don't allow anymore person to enter.
 - b. the voice link between the car and the building management desk (or fireman level) is established (see **5.6.1**)

5.7.2 End of the "evacuation mode"

The evacuation mode will stop:

- 1) When the "evacuation" signal is switched off by the building management and the lift is at the exit floor or,
- 2) As soon as the lift is switched in "Fireman mode" phase one as described in EN 81-72 when the fire-fighters arrive on the site

6 Verification of safety measures and/or protective devices

Safety requirements and/or protective measures of clauses 5 shall be verified according to the Table 1 below.

Table1 — Verification Table

Sub clause	Visual inspection ¹⁾	Compliance with the lift design ²⁾	Design document check ³⁾	Functional Test ⁴⁾
5.3.1	X			
5.3.2			X	
5.4.1	X			X
5.4.2.1	X			X
5.4.2.2	X			X
5.5.1	X			X
5.5.2	X			X
5.6				X
5.7.2				X
5.7.3				X
5.7.4				X
7			X	

- 1) The results of the "visual inspection" are only to show that something is present (a marking, a control panel, an instruction handbook), that the marking required satisfies the requirement and that the content of the documents delivered to the owner is in accordance with the requirements;
- 2) the results of the "compliance with the lift design" are to prove that the lift is built according to the design and that the components/devices comply with the design documents;
- 3) the results of the "design document check" are to prove that the design requirements of the standard have been matched "on paper" in the design documentation (layout, specification);
- 4) the results of the "functional test" are to show that the lift works as intended, including the safety devices.

NOTE Where the Installer uses a type-tested product the test and inspections will be as defined in the product documentation.

7 Information for use

Instructions have to be passed to the building owner in the instruction handbook (owner documentation) of the lift describing the behaviour of the lift in evacuation mode and the need to maintain and to periodically test that the fire alarm system is in working order.

Annex A (informative)

Concept of evacuation lifts

NOTE: To be discussed within CEN/TC127 and CEN/TC10/WG6

A lift to be used for the evacuation of disabled people should be an evacuation lift and should be operated under the direction and control of management or specially trained persons. It is important that only disabled people with impaired mobility rely on a lift in case of fire and essential that the lift car is taken only to those levels where a disabled person is in need of assistance.

To make such a system effective, a number of "fire assistants" should be designated and they should be capable of carrying out the necessary duties quickly and efficiently at all times during which the building is occupied.

Depending of the building evacuation strategy 2 types of evacuation of disabled persons with impaired mobility can be realised (the choice of this strategy has to be determined when the lift is specified and ordered to its supplier)

- Evacuation under the control of a "fire assistant" who controls the lift as an attendant (lift driver),
- Self evacuation without lift attendant (automatic collective control), or assisted if required by the "fire assistants" appointed at each level.

The evacuation procedure for disabled people should begin at the first warning of alert or fire.

In premises where there is a two-stage fire warning system, this may be on the sounding of the "alert" or "first-stage" alarm. Except in two storey buildings, some form of communications system should be provided to enable the rapid and unambiguous identification of those storeys with disabled people requiring evacuation, and the relaying of this information to the person operating the evacuation lift car.

If an evacuation lift fails to arrive at a landing, or access to it at any level is obstructed by the fire, it will be necessary to use a stairway. Should the lift itself remain safe to use it may only be necessary to descend to the storey below using the stairway and from there continue the descent by lift. It is necessary therefore to determine the best method of negotiating stairs and some practice may be necessary.

As soon as the fire service arrives they may take management of the evacuation but this should not be assumed as the evacuation of the building is normally the responsibility of the building operator.

If the evacuation mode is initiated automatically the building management should have provision to override the signal.

Subsequent priorities for the use of evacuation lifts and firefighting lifts may then be decided by the fire service.

The duties to be undertaken by the "fire assistant" of each level, immediately on receipt of an alert signal, should include the following.

- a) ensure that any disabled people in the storey for which that person is responsible move to the nearest refuge (lift lobby etc.) to await the lift;

- b) help in the evacuation of disabled by using the lift.
- c) inform those in charge of the urgency of the situation on their floor
- d) Notify those in charge when everyone n their floor has been evacuated

It should be appreciated, however, that the actual fire conditions may necessitate changes in the planned sequence.

Annex B. (informative)

Building requirements

In order to allow a lift to be used for evacuation several building design issues have to be satisfied by regulation and negotiation. (see 1.4.11)

Although building requirements would be outside of the scope of the lift specifications these different topics are listed here as basic assumptions and some possible solutions are suggested for safe evacuation by lift.

It will be the task of a common work with the TC 127 to determine the most appropriate requirements.

As a basis due to the fact that the lift comply with the requirements of EN 81-72 the building requirements listed in 5.1 of this EN 81-72 standard are satisfied.

Due to the fact that the national regulations for fire are today not yet harmonized, it will be necessary for some topics to propose solutions at the national fire authorities. These fire authorities will determine the most appropriate solutions depending of the national regulation in force.

B.1 Number of lifts dedicated to evacuation

In a building with several lifts, the number of lifts dedicated for evacuation has to be determined in accordance with the number of persons with impaired mobility needing to evacuate using lifts and taking into account the building use and the building evacuation strategy.

B.2 Refuge

A refuge is a designated temporary safe place where people with impaired mobility can wait for a period of time whilst the evacuation process is being undertaken.

It is not a place to leave people for the duration of the alarm, but it has been selected for its additional protection from fire, meaning that it will remain a safe place to wait.

The provision of a refuge will permit a staged evacuation to be implemented if required

In this situation, a refuge is an area that is both separated from the fire by fire-resisting construction and which has access via a safe route to a floor exit.

Examples of satisfactory refuges include:

- an enclosure such as a compartment, protected lobby, protected corridor or protected stairway
- any other arrangements which satisfy the general principles outlined above and which provide at least an equal measure of safety.

B.2.1 Size

The size of the refuge must be determined in accordance with the number of disabled persons (mainly wheel chair users) being accepted in the building.

It should be of sufficient size to accommodate both people using it as a refuge and any people passing through on their way to an exit from the building.

B.2.2 Enclosure

Fire resistance of the refuge and of its door(s) has to be specified according to local regulation.

B.2.3 Doors of the refuge

It's especially important to ensure that locks, doors and other devices are all able to be operated by the evacuating persons

B.2.4 Signalisation

In all horizontal circulation areas a signalisation system should indicate the position of a refuge.

Refuge area must be identified by a pictogram, see **Figure B.1**.

The size of the pictogram shall be at least 50 mm.



Illustration in white

Background in blue

NOTE In the refuge an instruction should be displayed stating :

"Refuge area. In case of evacuation the use of the evacuation lift is restricted to the person with impaired mobility assisted by persons specially trained or rescue authorities".

Figure B.1 — Pictogram "Refuge"

B.2.5 Voice link

As soon as the evacuation is initiated then a voice link through a 2 way communication system should be made ready for use between the refuges and the main floor

NOTE To avoid interference with background noise it's preferable to have an handset device or an interphone operated by a switch.

B.2.6 Emergency lighting

Refuges must be equipped with emergency lighting according to local regulations,

B.2.7 Smoke protection of the shaft and refuge areas

In order to be able to use the lift for evacuation measures have to be taken to avoid smoke entering into the lift shaft and refuge areas. These measures can be one of the following.

a) Smoke evacuation

Smoke evacuation in the shaft and in the refuge area

Pressurisation

Pressurisation of the shaft and of the refuge area

The most appropriate measures have to be determined by the local fire authorities

B.2.8 Evacuation chair

Some refuges in the building must be equipped with evacuation chair in order to facilitate evacuation of people with impaired mobility (persons using walking stick, crutches, walking frame, rollator) who are not wheelchair users.

Number and location of these evacuation chairs will be determined by national regulation

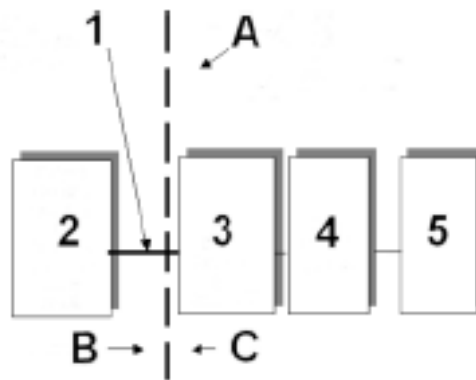
B.3 Alert and/or fire detection system

An alert and/or fire detection system in accordance with local fire regulation must be able to send an "evacuation" signal to the designated lift(s) (see 5.7.).

Annex C (informative)

Provision of automatic fire detection and lift interfaces

Figure C.1 illustrates the interface between automatic fire detection system and lift control(s).



Legend:

- A Border
- B Building
- C Lift
- 1 Wiring between interface not provided by the lift installer (it will give terminals at disposal)
- 2 Output signal of the Fire detection signal (or manual signal for evacuation)
- 3 Lift interface
- 4 Lift control
- 5 Lift

Fig C.1 - Interfaces

Bibliography

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