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Building hardware — Electrically controlled exit systems for use on escape routes — Requirements and test methods

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National foreword

This British Standard is the UK implementation of EN 13637:2015.

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A list of organizations represented on this committee can be obtained on request to its secretary.

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Quicaillerie pour le bâtiment - Systèmes de fermeture contrôlés électriquement destinés à être utilisés sur des voies d'évacuation - Exigences et méthodes d'essai

Schlösser und Baubeschläge - Elektrisch gesteuerte Fluchttüranlagen für Türen in Fluchtwegen - Anforderungen und Prüfverfahren

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

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Foreword

This document (EN 13637:2015) has been prepared by Technical Committee CEN/TC 33 “Doors, windows, shutters, building hardware and curtain walling”, the secretariat of which is held by AFNOR.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by December 2015, and conflicting national standards shall be withdrawn at the latest by March 2017.

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

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

This European Standard is part of a group of Standards dedicated to building hardware products. It is one of a group of standards for exit devices and electrically controlled exit systems developed by Technical Committee CEN/TC 33.

This standard covers the Principle Elements of the Safety Objectives for Electrical Equipment Designed for Use within Certain Voltage Limits (LVD - 2006/95/EC).

According to the CEN/CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Introduction

Experience relating to fire and/or smoke hazards and general safety has made it desirable that doors in circulation areas, or those that have to be operated in an emergency situation, be fitted with exit devices.

Increasingly, such exit devices may form a part of the security system of a building and involve the use of electrical locking and controlling elements. This standard provides common European Standard requirements for such electrically controlled exit systems.

This standard offers, in addition to safety, increased security to avoid unsafe means of locking the door, for example additional padlocks and chains.

The performance requirements contained in this European Standard give safe and effective escape through a doorway with a **maximum of two operations** to release the electrically controlled exit system, although this might require prior knowledge of the number of operations (e.g. initiating and/or operating element), and of the door situation (e.g. inwardly opening).

This standard introduces the concept of time delayed exit and denied exit mode, as a means of increasing the security of the building against unauthorised exit, and the concept of central management control. It is the responsibility of the regulatory authorities in each member country to decide whether or not such control methods can be allowed, and if so, to what extent within the limits stated in the standard.

It is intended that the requirements of this standard should apply at all times, regardless of whether or not the building is occupied. For safety reasons, any additional features of the system, such as access control, are required to maintain the principle of fail safe release at all times.

The performance tests incorporated in this standard are considered to be reproducible and, as such, will provide a consistent and objective assessment of the performance of these electrically controlled exit systems throughout CEN Members.

1 Scope

This European Standard specifies requirements for performance and testing of electrically controlled exit systems, specifically designed for use in an emergency or panic situation on escape routes.

This European Standard covers electrically controlled exit systems that are either manufactured and placed on the market in their entirety by one manufacturer or assembled from sub-assemblies produced by more than one manufacturer and subsequently placed on the market as a kit in a single transaction.

These electrically controlled exit systems consist of at least the following elements, separated or combined:

— **initiating element** for requesting the release of electrical locking element in order to exit;

— **electrical locking element** for securing an exit door;

— **electrical controlling element** for supplying, connecting and controlling electrical locking element and initiating element;

— in addition, these electrically controlled exit systems can include **time delay and/or denied exit mode.**

The Products covered by this standard are intended to be used for doors on escape routes, on either fire or non-fire rated door assemblies.

Examples of Products covered by this European Standard:

— electrically controlled exit systems designed to be used in emergency situations, where people are familiar with the exit and its hardware;

— electrically controlled exit systems designed to be used in panic situations, where people are not always familiar with the exit and its hardware;

— electrically controlled exit systems for use on hinged or pivoted door leaves only;

— a range of electrically controlled exit systems including those for use on double doorsets;

— the exceptional case of electrically controlled exit systems intended for use on single leaf inwardly opening exit doors. It is assumed throughout this European Standard that exit doors generally open towards the outside in order to ensure safe escape. However, there are cases such as hospital or hotel bedroom doors, classroom doors, etc. where building authorities allow, by way of exception, the exit door to open against the direction of exit;

Products not covered by this European Standard:

— any particular design of electrically controlled exit systems and only such dimensions as are required for safety reasons are specified;

— any other element of a security system, other than those directly involved in the control of an exit door;

— mechanically operated exit devices containing electrical functions that are not related to release of an electrically locking element. Such devices are within the field of EN 1125 or EN 179;

— electrically controlled exit systems intended for use on inwardly opening double doorsets.

Electrically controlled exit systems intended for use by the severely disabled; due to the wide range of disabilities, such exit systems and their performances should be agreed between specifier and manufacturer.

2 Normative references

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

EN 179, *Building hardware - Emergency exit devices operated by a lever handle or push pad, for use on escape routes - Requirements and test methods*

EN 1125, *Building hardware - Panic exit devices operated by a horizontal bar, for use on escape routes - Requirements and test methods*

EN 1670, *Building hardware - Corrosion resistance - Requirements and test methods*

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

EN 1634-2, *Fire resistance and smoke control tests for door, shutter and openable window assemblies and elements of building hardware - Part 2: Fire resistance characterisation test for elements of building hardware*

EN 1634-3, *Fire resistance and smoke control tests for door and shutter assemblies, openable windows and elements of building hardware - Part 3: Smoke control test for door and shutter assemblies*

EN 55022, *Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement (CISPR 22)*

EN 60529, *Degrees of protection provided by enclosures (IP Code) (IEC 60529)*

EN 61000-3-2, *Electromagnetic compatibility (EMC) - Part 3-2: Limits - Limits for harmonic current emissions (equipment input current ≤ 16 A per phase) (IEC 61000-3-2)*

EN 61000-3-3, *Electromagnetic compatibility (EMC) - Part 3-3: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current <= 16 A per phase and not subject to conditional connection (IEC 61000-3-3)*

EN 61000-4-2, *Electromagnetic compatibility (EMC) - Part 4-2: Testing and measurement techniques - Electrostatic discharge immunity test (IEC 61000-4-2)*

EN 61000-4-11, *Electromagnetic compatibility (EMC) - Part 4-11: Testing and measurement techniques - Voltage dips, short interruptions and voltage variations immunity tests (IEC 61000-4-11)*

EN 61000-6-2, *Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments (IEC 61000-6-2)*

EN 61000-6-3, *Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for residential, commercial and light-industrial environments (IEC 61000-6-3)*

EN 60068-2-1: 2007, *Environmental testing - Part 2-1: Tests - Test A: Cold (IEC 60068-2-1:2007)*

EN 60068-2-2: 2007, *Environmental testing - Part 2-2: Tests - Test B: Dry heat (IEC 60068-2-2:2007)*

EN 60068-2-30:2005, *Environmental testing - Part 2-30: Tests - Test Db: Damp heat, cyclic (12 h + 12 h cycle) (IEC 60068-2-30:2005)*

EN 60947-5-5, *Low-voltage switchgear and controlgear - Part 5-5: Control circuit devices and switching elements - Electrical emergency stop device with mechanical latching function (IEC 60947-5-5)*

EN 61508-1, *Functional safety of electrical/electronic/programmable electronic safety-related systems - Part 1: General requirements (IEC 61508-1)*

EN ISO 7010:2012, *Graphical symbols - Safety colours and safety signs - Registered safety signs (ISO 7010:2011)*

IEC 60050-845, *International Electrotechnical Vocabulary — Lighting*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
exit device
mechanically operated device intended for panic exit function (panic exit device) or emergency exit function (emergency exit device) for use on escape routes

3.2
panic exit device
exit device conforming to EN 1125 intended to give safe and effective escape through a doorway with one single operation to release the panic exit device, with minimum effort and without prior knowledge of the panic exit device allowing safe escape even in the event of the door being under pressure such as by people being pushed against the door in the direction of escape

Note 1 to the entry A panic exit device contains bolt head(s) that engage(s) with a keeper(s) in the surrounding door frame or floor for securing a door when closed. The bolt head(s) can be released by the bar positioned horizontally across the inside face of the door when it is moved anywhere along its effective length in the direction of travel and/or in an arc downwards.

Note 2 to the entry Panic exit devices are intended for use where panic situations can arise. In a panic situation, a group of people will react differently from an individual. When two or more people are rushing to an escape door, probably in darkness and/or smoke, it is possible that the first one to reach the door will not necessarily operate the panic exit device, but can push the surface of the door (door under pressure) while other people will be trying to operate the horizontal bar by hand or body pressure.

Note 3 to the entry When a door opens in the direction of exit, a panic exit device can be used instead of an emergency exit device.

3.3
emergency exit device
exit device conforming to EN 179 intended for emergency purposes where panic situations are not likely to arise, to give safe and effective escape through a doorway with one single operation to release the emergency exit device, although this can require prior knowledge of its operation (see EN 179)

Note 1 to the entry An emergency exit device contains bolt head(s) that engage(s) with a keeper(s) in the surrounding door frame or floor for securing a door when closed. The bolt head(s) can be released by the lever handle or the push pad positioned on the inside face of the door.

Note 2 to the entry Exit devices conforming to EN 179 are intended for emergency purposes where panic situations are not likely to arise. Where a pressure against the door caused by people in a panic is foreseen, then a panic exit device conforming to EN 1125 should be used.

Note 3 to the entry Emergency exit devices are suitable also for inwardly opening single leaf exit doors.

Note 4 to the entry The term “pull pad” is sometimes used instead of “push pad” for use on inwardly opening exit doors.

3.4
exit system
electrically controlled system for use on escape routes according to EN 13637 which enables the electrical control of exit doors by means of electrical locking elements, an initiating element and electrical controlling elements. These separate elements may be inter-connected or may be combined in various assemblies, to provide the required system functions

3.5
electrical locking element
electrically operated element of an exit system that maintains the door in secured condition. For example: an electrical magnet, an electrical strike, an electrically lockable operating element (see 3.9)

3.6
controlling element
the element in an exit system which monitors, supplies, connects and controls the electrical locking element and initiating element

3.7
initiating element
manually operated element for initiating the release of electrical locking elements in order to allow the exit

3.8
operating element
manually operated element of an exit system or an exit device that mechanically releases the door

3.9
electrically lockable operating element
operating element which, when energized, prevents the release of the door

EXAMPLE: an electrically lockable panic exit device or an electrically lockable lever handle

3.10
to reset
to manually or automatically return the exit system to its original condition

3.11
rated supply voltage
nominal voltage for which the system is intended

3.12
to release
to deactivate the electrical locking element by disconnecting it from electric power (fail save principle) to unlock the electrical locking element

Note 1 to the entry to open the door, it may be necessary to additionally operate a mechanical exit device.

3.13
fail safe
ability of an exit system, to release during a power interruption or the failure of any one electrical component or connection between controlling, locking and initiating elements of the system

3.14
single time delay (t1)
fixed time delay between the actuation of the initiating element and the release of the electrical locking element

3.15
double time delay (t1+t2)
time delay (t1) with the additional possibility of manually initiating a further time delay (t2) through a central management control

3.16
central management control (CMC)
centrally controlling panel supervised by authorized personnel to monitor and to operate electrically controlled exit systems including the double time delay function and/or denied exit function

Note 1 to the entry CMC may control either a complete building or a part of it, to remote doors individually or group(s) of doors.

Note 2 to the entry CMC may include an interface to e.g. Alarm System, Building Management, Visualization, Video control, access control 3.18

3.17
immediate release
release in one second or less

3.18
keeper
part of an exit system such as a strike, socket or other fitting with which the bolt head(s) engages

3.19
denied exit mode
manually activated mode denying the exit when the initiating element is operated, i.e. during periods of time when the public are not allowed in a building or the area concerned

3.20
visual inspection
assessment made with the naked eye, adjusted for normal vision

3.21
functional test
assessment made by operating the test door (opening and closing) and/or operating any element of the exit system

3.22
measurement
assessment made by using a measuring tool

3.23
operation (to release the door)
one movement in one direction to release the door (not to open it)

3.24
dogging mechanism
part of an exit system for holding the bolt heads in the withdrawn position until reset

3.25
access level
according to the different situations of operation, functions and maintenance the exit system deals with necessary precautions to avoid unsafe situations according to staff skills and responsibility

Note 1 to the entry see Annex D

3.26
failure
a single fault which may lead to a dangerous situation, caused by a component, a programme or an external influence, etc

3.27
failure criteria
performance limit(s) for test procedure(s), relevant to fulfil the requirements

4 Requirements

4.1 General

4.1.1 Compliance

An electrically controlled exit system shall be tested in accordance with the specified test methods in Clause 5. The performance of the electrically controlled exit system (or components) shall conform to the specific requirements.

4.1.2 Association between components

4.1.2.1 Technically independent components

The manufacturer of an electrically controlled exit system may be combined with "**technically independent components**", with mechanical exit devices according to EN 179 or EN 1125.

"Technically independent components" means: exit devices without any electrical and/or mechanical interaction on the safety functions of the exit system.

On a door in an escape route equipped with the Exit System in combination with an exit device, this exit device will comply with EN 1125 or EN 179, to maintain the performances of the complete combination.

It shall be on the manufacturer of an electrically controlled exit system to declare which exit devices to EN 1125 or EN 179 could be combined with the exit system.

4.1.2.2 Technically dependent components

On the other hand, systems according to EN 13637 may include "**technically dependent components**", with an electrical and/or a mechanical interaction on the safety functions of the exit systems, an exit device according to EN 1125 or EN 179 such as an initiating element being integrated in the operating element.

In this case, this device is part of the complete system and covered by EN 13637, and an exhaustive list of all possible components shall be written in the system manufacturer instructions

4.1.3 Access level

The system shall be designed to be operated by adequate access levels.

NOTE The access levels for each operation on electrically controlled exit system are described in Annex D.

4.2 Ability to release (for doors on escape routes)

4.2.1 Number of operations to release

The release of an electrically controlled exit system shall be achieved by either one or two single operations, not requiring any other action e.g. the use of a key or any other object.

The design of an electrically controlled exit system shall be such that neither of the two single hand operations permitted requires a reverse movement of the initiating or operating element in the direction towards its original position before an exit can be achieved, regardless of the sequence of the operation.

NOTE For example, a lever handle that has to be returned towards its original position before releasing the door, is not permitted.

Compliance shall be verified by functional test described in 5.2.1

Test result shall be expressed by “releases in 2 single operations maximum”

If the electrically controlled exit system is to be mounted on a door where a mechanical operating element is already mounted and is not part of the system, then the additional operation to release the door should be taken in account for the assessment of the complete solution.

4.2.2 Operation of initiating element

An initiating element shall operate:

— Horizontally (e.g. for a push button, or an initiating element integrated into a panic exit device type touch bar), or

— Parallel to the door face and downwards (e.g. for an initiating element integrated into a lever handle) or

— Horizontally and downwards. (e.g. for an initiating element integrated into a panic exit device type push bar or a push pad).

Reverse movement (in the opposite direction of exit) is only permitted when the initiating element is integrated in the operating element of an emergency lock type B intended to be pulled for releasing the electrical locking element.

See Figure A.1 and Figure A.2.

Compliance shall be verified by functional test described in 5.2.2.

Test result shall be expressed by “operates correctly”.

4.2.3 Input signal from an alarm system

If the exit system is designed to be linked to an alarm system, then it shall be able to receive a signal to release the locking element and shall allow exit according to one of the following release modes:

a) Immediate automatic release within a time of 1 second of the electrical locking element: the exit system shall allow immediate exit by operating the operating element or by pushing the door;

b) Immediate release within a time of 1 second on request of the release of electrical locking element (time delay reset to zero but no release of the electrical locking element): the exit system shall allow immediate exit after operating the initiating element and the operating element; optionally, the electrical locking element can be released from a central management control (CMC) ;

The exit system product information shall include the limitations of the type(s) of signal and the release mode that can be processed.

When the exit system is designed to enable two release modes, the requested release mode shall be set only during the installation stage by requiring a specific tool and/or identification means.

NOTE There are many different types of signal that can be used in an alarm system, the input signal can be supplied from a clean contact achieved by a relay or optocoupler or a reed contact. Alternatively, a bus system can be accepted.

Compliance shall be verified by the test procedures described in 5.2.3.

Test result shall be expressed by “input signal ok”.

4.2.4 Resetting conditions

An exit system shall be designed to be reset manually at the door. The resetting of the exit system at the door shall be achieved with a tool or a key, or other means of identification to reserve this operation to authorized personnel.

Where the exit system is linked to a central management control (CMC) monitoring the exit, the resetting shall be achieved from the CMC after a minimum time of 60 s from the release of the electrical locking element.

In complement, it is allowed, when automatic resetting of the exit system is available, and in cases where the door has not been opened after initiating exit, the automatic resetting of the system shall be achieved after a minimum time of 60 s from the release of the locking element.

The resetting conditions shall be as indicated in Table 1.

Table 1 — Resetting conditions

Reset criteria	*Condition*	*At the door*	*Remote from the CMC after 60 s*	*Automatic after 60 s*
Release from external alarm system	*After the alarm has ended*	*X*	*X (Just after the alarm has ended)*	*X (Just after the alarm has ended)*
Emergency release with impulse initiating element	*Initiating element has been operated but door was not opened*	*X*	*X*	*X*
	Initiating element has been operated and door was opened	*X*		
Emergency release with bistable initiating element	*Initiating element has been operated and pulled back but door was not opened*	*X*	*X*	
	Initiating element has been operated and pulled back but door was opened	*X*		
After t1 or t2	*Door was not opened*	*X*	*X*	*X*
	Door was opened	*X*		
One failure detection	*The failure has been fixed*	*X*		
After power failure	*Power recovered*	*X*	*X*	*X (After power recovered)*
CMC emergency push button	*The issue has been fixed*		*X*	
Release with impulse initiating element included in the operating element without time delay	*Initiating element has been operated*	*X*	*X (When Initiating element is no longer operated)*	*X (When Initiating element is no longer operated)*

Compliance shall be verified by functional tests described in 5.2.4.

Test result shall be expressed by “resetting conditions ok”.

4.2.5 Operating element

When an exit system incorporates an operating element, using either a horizontal bar, lever handle or push pad, it shall conform to the requirement of EN 1125 or EN 179.

When an operating element incorporates electrical locking, the exit system in a non-energized state shall conform to EN 1125 or EN 179.

Chances are that the exit system may be operated by the public in the wrong sequence (i.e. operate the operating element and then operate the initiating element). This should not impede the safe release of the exit system under load. See 4.2.8 and 5.2.8.

NOTE When an operating element integrates an electrical locking element, It is acceptable, in order to prevent misunderstanding or misuse, to have a minimum resistance and/or a minimum travel of the operating element before initiating the release of the system.

Compliance shall be verified by functional tests described in 5.2.5.

Test result shall be expressed by “Comply with EN 1125 or EN 179”.

4.2.6 Fail safe function and reliability of liaison and transmission paths

4.2.6.1 General

The design of an electrically controlled exit system shall be such that any failure of a component included in a single electrical element (initiating element, controlling element, electrical locking element, CMC or safety connections) or any failure of the connection between the controlling, initiating or locking elements shall not affect the immediate release of the door or at the end of the set time delay. In addition, if after a request or a release, one of the relevant safety components concerned by the ability to release fails, the exit system shall not allow any automatic or manual reset until been repaired. This is also required if one redundant component or function is affected by the failure.

The definition of single failure of the electrically controlled exit system shall be SIL 2 (safety integrity level) according to EN 61508-1.

Any additional feature incorporated in an exit system, for example access control, time zoning, monitoring or security functions, shall not reduce the safety performance of the system.

When the manufacturer offers any additional functions not covered by this standard, these shall be listed in the product information document.

If tests conducted by the test lab have shown that additional functions do not have any influence on the safety function, they do not have to be verified.

In addition, the design of the initiating element shall be:

— in compliance with the EN 60947-5-5;

— and/or shall ensure that under the operation with a force of maximal 80 N, the direct opening action component shall prevent the case of melting contact (one single failure).

This level of safety allows in this particular design the ability for only a manual resetting according to the consequence if the circuit stays open due to the failure of the locking element shall not be reenergized.

The functions to be fail safe shall be as indicated in Table 2.

Table 2 —Functions to be fail safe

Requirement	Criteria	Fail safe requirement
4.2.2	Release function - Operation of initiating element	Yes
4.2.5	Release function - Operating element, including locking element	No (see note below)
4.2.17	Time delay t1 / t2	Yes
4.2.18.2.1	CMC Safety functions	Yes

NOTE A fail safe requirement on a mechanical device is not achieved in case of failure of one mechanical component (see tests methods in EN 1125 and EN 179).

Compliance shall be verified by visual inspection, functional tests and/or measurements and 5.2.6.

Test result shall be expressed by “fail safe”.

4.2.6.2 Software and hardware documentation

Only safety-relevant functions have to be documented and checked. This refers to the hardware and the software.

The manufacturer shall prepare documentation for the test laboratory that gives an overview of the hardware and of the software design if it includes safety-relevant functions. It shall include at least the following:

a) a functional description of the hardware and software design and main program flow (e.g. as logical and electrical diagram, a flow diagram or structogram) including:

   1) a brief description of the modules and the functions that they perform;

   2) the way in which the modules interact;

   3) the overall hierarchy of the program;

   4) the way in which the software interacts with the hardware of the device;

   5) the way in which the modules are called, including any interrupt processing.

b) a description of which areas of memory are used for the various purposes (e.g. the program, site specific data and running data);

c) a designation, by which the software and its version can be uniquely identified.

The manufacturer shall also prepare detailed design documentation, which only needs to be provided if required by the testing authority. It shall comprise at least the following:

d) an overview of the whole system configuration, including all software and hardware components;

e) a description of each module of the program, containing at least:

   1) the name of the module;

   2) a description of the tasks performed;

   3) a description of the interfaces, including the type of data transfer, the valid data range, and the checking for valid data.

If safety-relevant functions for the release of the door depend on software functions, the following requirements for software design shall apply:

f) the software shall have a modular structure;

g) the design of the interfaces for manually and automatically generated data shall not permit invalid data to cause any error in the program operation;

h) the software shall be designed to avoid the occurrence of deadlock of the program flow.

Compliance shall be verified by visual inspection, functional tests and/or measurements described in 5.2.6.

Test result shall be expressed by “Software and hardware documented”.

4.2.7 Release force - Door not under pressure

When an electrical locking element or an electrically lockable operating element is tested in accordance with 5.2.7, it shall have a maximal test force of 80 N to release the door within 1s. When applicable, the force to operate the operating element shall correspond to EN 1125 or EN 179. Test result shall be expressed by “release not under pressure”.

4.2.8 Release force - Door under pressure

When an electrical locking element or an electrically lockable operating element is tested in accordance with 5.2.8, it shall be able to release the door within 1s under a load of 1000 N in opening direction.

Test result shall be expressed by “release under pressure”.

In certain conditions (i.e. for double doors or larger doors), the electrical locking element or an electrically lockable operating element could release with a higher load than 1000 N. In this case, the higher test load should be reported in the test report.

4.2.9 Release from the Initiating element

When an initiating element is tested in accordance with 5.2.9, it shall give an electrical release signal to the controlling element when operated with a force not exceeding 80 N.

The design of the initiating element shall:

a) either be in compliance with the EN 60947-5-5; or

b) be equipped with a “direct opening action component” preventing a failure caused by a melted contact; or

c) fulfil the “single failure” requirement according to 4.2.6.1.

NOTE A lower operating force may be required, i.e. to cover accessibility for the young or elderly.

Test result shall be expressed by “release from the initiating element”.

4.2.10 Release after power supply failure

An exit system shall be designed such that it guarantees a correct operation of the locking element to a threshold of 15 % less than its rated voltage (U min).

When the system goes below the minimum specified, it shall guarantee the ability to release either immediately or after the set time delay. This requirement applies whether or not battery back-up supplies are incorporated. After the power supply is re-established, the exit system can be automatically reset.

The exit system shall be able to function correctly over the anticipated range of supply voltage conditions +15 % / −15 %.

Compliance shall be verified according to 5.2.10 and 5.6.11.

After the test, the door shall release immediately, or after the set time delay. Test result shall be expressed by “release after power supply failure”.

4.2.11 Dimensional and design

4.2.11.1 Door free movement

The design of an exit system shall be such that the bolt head(s), or any other element, once the door has been released to open, does not restrict or impede the free movement of the door.

The design of an exit system can include a dogging mechanism or an automatic relatching device. If the exit system is equipped with a dogging mechanism or a device retaining the bolt(s) or any other element retracted, this shall not impede the free movement of the door once released.

An exit system shall be designed to avoid accidental release of the bottom bolt, or any other element, preventing the free opening of the door.

Exit systems intended for use on smoke/fire resisting doors, shall comply with 4.4.

The design of an exit system intended for use on double doorset leaves shall allow both leaves to be opened simultaneously and to swing freely in the direction of exit once the door has been released. For example, on rebated double doors, operating the exit system on the inactive leaf will release both the inactive and the active leaf.

NOTE The construction and installation of a specific doorset assembly, including choice of hinges, leaf thickness and leaf width, can have a significant effect on the ability of both leaves to open simultaneously. These issues are beyond the scope of this European Standard. Additional guidance is given in A.3.

4.2.11.2 Exposed edges and corners

In order to avoid injury, an exit system shall have all edges and exposed corners rounded to a radius of not less than 0,5 mm.

4.2.11.3 Accessible gaps

An exit system shall be designed such that the top surface of any operating or initiating element, chassis or other mounting assembly does not contain any accessible gap that could inadvertently be blocked by a foreign object, resulting in failure of the exit system to operate.

A steel test piece of 10 × 15 × 20 mm placed in any accessible gap and in any orientation shall not prevent correct operation of the exit system.

4.2.11.4 Projection in the clear passage

Any component of an exit system mounted on the door frame shall not obstruct the free opening of the door more than:

— A = 70 mm from the clear opening,

— B = 100 mm from the transom,

to minimize the risk of injury to persons using the exit. See Figure 1.

Any initiating element integrated within an operating element (e.g. such as a sensitive bar) shall not project from the door face more than 150 mm (large projection) or 100 mm (standard projection). See EN 1125 or EN 179.

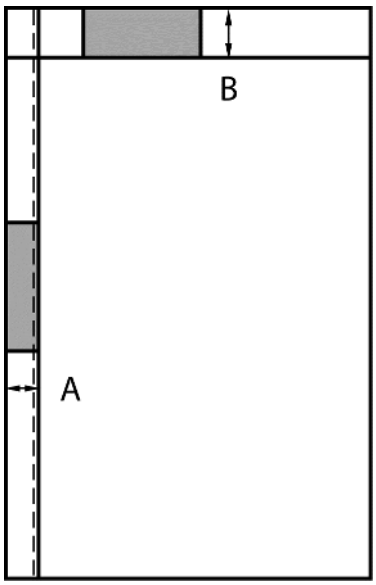


Figure 1 — Projection of an exit system components into clear passage

4.2.11.5 Initiating element

An initiating element can be a separate element, such as a button, or it can form part of an operating element, such as a lever handle, a push pad or a bar. It can be activated for example by pushing a button, moving a switch or touching a sensitive part of the initiating element. The active surface area shall be:

a) where an initiating element is part of a button, it shall have an active surface area of not less than 700 mm^2, and no dimension of the active surface shall be less than 30 mm and not more than 15 mm distance from the projecting point of the cover to activate;

b) where an initiating element is part of a lever handle, the active surface area shall cover at least 80 % of its prehensile top surface and front face (part that can be reached by the hand) with a minimum height of 20 mm;

c) where an initiating element is part of a push pad, the active surface area shall cover at least 80 % of its prehensile top surface and front face (part that can be reached by the hand) with a minimum height of 20 mm;

d) where an initiating element is part of a bar extending across the door face, the active surface area shall cover at least 60 % of the door width with a minimum height of 20 mm;

e) where an initiating element is part of an operating element, the active area shall be clearly identified;

f) to avoid an accidentally activating of the initiating element, and create false alarms, is it allowed to cover the initiating element with a frame against perpendicular operation of the initiating element to the activating direction.

NOTE It is important that the public understands clearly which part of the initiating element (lever handle, push pad or bar) is to be operated.

4.2.11.6 Illuminating means of initiating element

Where the initiating element is not incorporated into an operating element, it shall have its own illuminating means to indicate the active surface area while the door is secured by locking element.

Photoluminescence finishes as sole means are acceptable, providing that they comply with IEC 60050-845.

4.2.11.7 Signalling elements

An electrically controlled exit system shall incorporate visual signalling elements at a distance of not more than 1 m from the initiating element to indicate its status.

An exit system with time delay function shall in addition to the visual signalling elements incorporate audible and/or visual signalling elements at a distance of not more than 1 m from the initiating element to indicate the remaining delay time until the locking element is released.

Signalling elements can be light emitting diodes (LED), down counter until exit permitted (i.e. bar graph, decreasing numbers, etc.) or other means.

An exit system with double time delay function shall be equipped such that the exit is visible and controlled by authorized personal either directly or by means of a video monitoring system.

An exit system with denied exit mode shall incorporate visual signalling elements at a distance of not more than 1 m from the initiating element to indicate that the electrical locking element remains locked.

NOTE The performance of a video monitoring system is beyond the scope of this European Standard.

Visual signalling elements are used to signal the state of an exit system, the following criteria shall be observed:

— No light: exit system is not energized;

— Red light: electrical locking element is locked;

— Green light: electrical locking element is released;

— Down counter (i.e. bar graph, decreasing numbers, etc.) for systems with time delay: time remaining until exit is permitted.

The rest of the visual signals shall be upon manufacturer instructions (flashing, warning, false use…).

Where audible signalling elements are used, the following criteria may be used:

— Down counter for systems with time delay: time remaining until exit permitted (i.e. bips, pulse signals, etc.);

— Request to exit: alert signal when pressing the initiating element;

— False use warning: warning informing that the door is locked.

Compliance of 4.2.11 requirements shall be verified according to 5.2.11.

Test result shall be expressed by “dimensions and design ok”.

4.2.12 Door mass and door dimensions

The exit system shall be tested with a test door according to the following mass and dimensions:

— Door mass: max 200 kg;

— maximum door width, excluding any rebates: up to 20 % increase of the width of the test door (i.e. maximum increased width = 1 320 mm);

— maximum door height, excluding any rebates: up to 20 % increase of the height of the test door (i.e. maximum increased height = 2 520 mm).

Beyond these limits an exit system shall be tested according to 5.2.12:

Test result shall be expressed by “tested with a door width: xxx, height: yyy, mass: zzz”.

4.2.13 Keepers

In case of using exit device to EN 1125 or EN 179, the design of an exit system shall include a keeper(s) to keep the door in the secured position.

Keepers shall provide protection for any part of the door or frame that could be damaged by the exit system during the opening and closing cycle of the door.

The design of a floor keeper shall be such that dust and dirt can easily be removed. If the keeper is not fitted flush, the exposed part of the keeper shall not be upper than 15 mm in height (dimension H) from the surface to which it is mounted. It shall be chamfered in the direction of escape at an angle (M) not exceeding 45° from the horizontal, and any up stand (dimension P) shall not exceed 3 mm. See EN 1125 or EN 179.

Compliance shall be verified by test described in 5.2.13.

Test result shall be expressed by “Keepers ok”.

4.2.14 Initiating element with cover

If an initiating element is equipped with a transparent cover, it shall be designed in such a way that it will not cause any injuries when operated.

A cover to an initiating element shall not require an additional operation to be removed or broken.

Compliance shall be verified by test described in 5.2.14.

Test result shall be expressed by “Cover of initiating element ok”.

4.2.15 Finger trapping

The exit system will be designed in order to prevent the risk of trapping fingers and/or the blocking of the exit system.

Compliance shall be verified by functional tests described in 5.2.15.

Verification is not required if already tested to EN 1125 or EN 179.

Test result shall be expressed by “Finger trapping test ok”.

4.2.16 Pictogram

The function of the initiating element of an exit system shall be clearly marked by using a pictogram, either on or adjacent to the initiating element. Its surface area shall be not less than 8 000 mm^2 (or 2500 mm^2 if the surface of the pictogram is actively illuminated). Its colours shall be white on a green background.

The following pictograms given in Figure 2 or as in EN ISO 7010:2012 shall be used:

a) System without time delay

b) System with time delay

Figure 2 — Initiating element function pictograms

Compliance shall be verified by visual inspection, functional tests and/or measurements described in 5.2.16.

Test result shall be expressed by “Pictograms ok”.

4.2.17 Time delay

If an exit system is designed to include time delay, it shall enable release after the initiating element has been operated and show the time delay status. When the exit system is tested in accordance with 5.2.18, the locking element shall be released immediately at the expiry of the set time delay.

The time delay of the exit system shall not exceed the following duration:

— **Grade 1**: Single time delay

  — t1 = 15 s maximum;

— **Grade 2**: Double time delay

  — t1 = 15 s maximum;

  — t2 = 180 s maximum.

NOTE The time delay periods may be reduced from the times shown in 7.2.10.

To minimize the incidence of false alarms, it is permissible for a local false use warning to be triggered during the early part of the actuating travel of the initiating element or when approaching it.

During an operating sequence, none of the time delay periods can be extended or repeated.

Grade 2 is only applicable with the use of a Central Management Control. See 4.2.19.

The device to activate this function shall be designed to be operated under adequate access level (see Annex D).

Compliance shall be verified by visual inspection, functional tests and/or measurements described in 5.2.18.

Test result shall be expressed by “Grade x” according to 7.2.10.

4.2.18 Central Management Control

4.2.18.1 Central Management Control – Functions

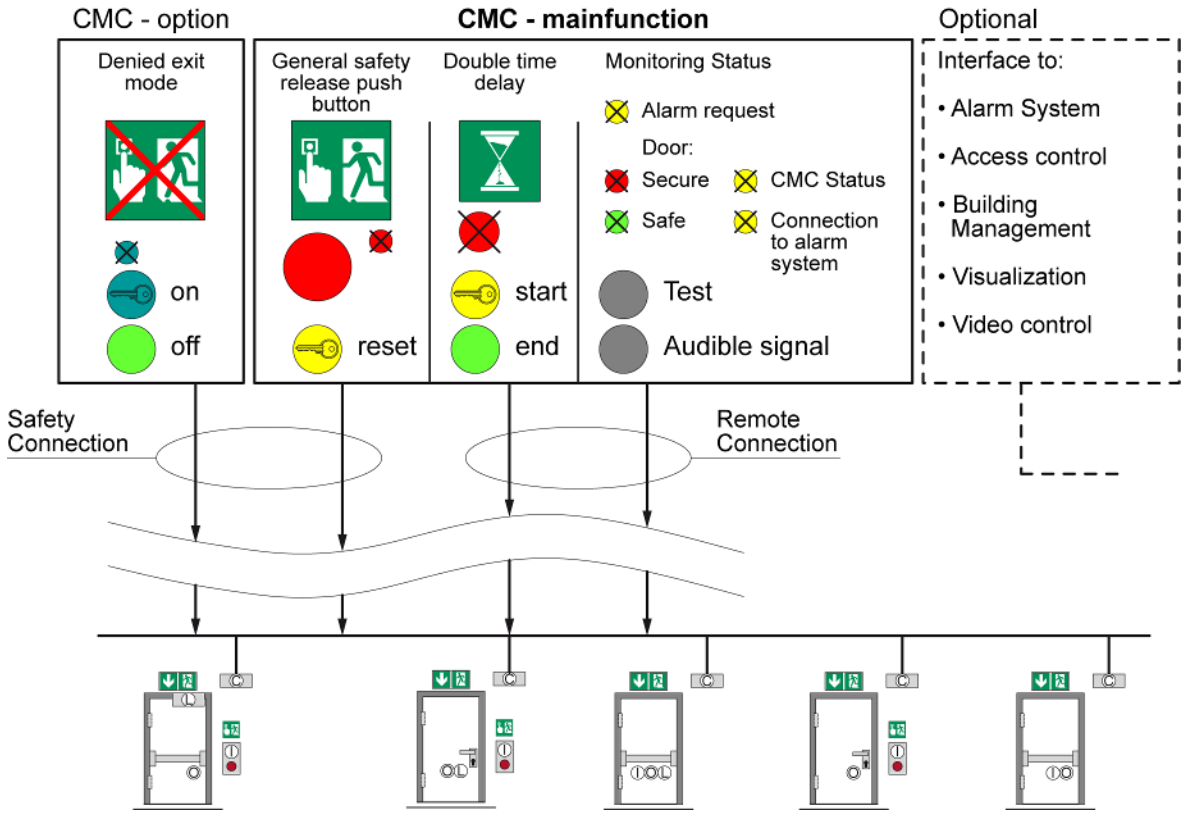


Figure 3 — Example of a CMC Control Panel

For exit doors with electrically controlled exit systems and double time delay and/or denied exit mode the CMC is mandatory. Exit doors without double time delay or denied exit mode could also be connected to the CMC.

The layout of the CMC (see Figure 3) is an example, but the operating functions and the display of the status are mandatory.

The CMC is mandatory to use when the double time delay function and/or denied exit function is intended for the building security and/or changing the door function mode.

Central Management Control (CMC) shall include the following functions:

— General safety release push button;

— Possible connection to alarm system;

— Reset after request to exit (after general safety push button operated on CMC, or after request from a door);

— Door function modes;

— Authorized access functions.

Other optional functions may be operated by the CMC:

a) control/monitor at least one exit door locking element or doors at the same time, for example to allow the release of several doors,

b) double time delay,

c) denied exit mode,

d) switching exit systems of one or several doors in different configured working modes, e.g. with or without time delay according to the building uses.

e) output signals, for example video monitoring,

f) input signals, for example from access control system,

g) the software dedicated to the management of the exits of the building,

h) the resetting of the system. (for example, in case of maintenance).

NOTE A CMC can be connected to one or more exit systems EN 13637.

4.2.18.2 Central Management Control – Requirements

4.2.18.2.1 CMC Safety functions

The purpose is to ensure the ability to release with the general safety release push button and optional denied exit mode, covering safety conditions on communication path and interactions with door exit system.

This ability to release covers also the situation of one or more CMC interconnected.

Safety communication path might be a separate line or integrated in one line together with the remote function or in a network system, for wired or wireless connections systems.

One failure safety (i.e. any single failure in the safety function) shall not influence the ability to release the locking element:

— immediately after an initiating element request; or

— at the end of the time delay t1 or t2; or

— automatically according to the failure criteria (see test methods below).

Any additional functionality, integrated in the CMC or external to the CMC, shall not under any circumstances, impair the safety function of the CMC and the ability to release.

Compliance shall be verified by test methods described in 5.2.18.2.1.

4.2.18.2.2 CMC Remote functions

The purpose is to ensure the building exit door management:

— handling of double time delay function;

— control from a central point the status monitoring of the installation;

— interact with door exit systems about the release and possible changing of the door function mode (e.g. with or without time delay);

— possible interface functions with other external systems.

This shall not interfere or overrule with the safety functions of the CMC and/or the door exit systems, and comply by design to the requirements of the time delay and denied exit mode.

When the design includes microcontroller(s), the system shall provide a watch dog and self-checking function.

Compliance shall be verified by test methods described in 5.2.18.2.2.

4.2.18.2.3 General safety release push button

The purpose is to release from one or several central points (security guard), the entire building or part of building group doors immediately in case of emergency or panic situation. This might be activated by any people in the security staff premises, but its resetting belongs to authorized person with key or any others identification solutions.

This shall meet the requirements of the initiating element regarding button definition, one failure safety, combined with a pictogram for definition of the function (reduced size minimum = 400mm^2), a visual (mechanical or electrical) indication of the activation and optional audible signal.

The device to operate this function shall be designed to be operated by adequate access level, (see Annex D).

Compliance shall be verified by visual inspection, functional tests and/or measurements, described in 5.2.18.2.3.

4.2.18.2.4 Denied exit mode

The denied exit mode shall be activable only when neither initiating element nor resetting has been activated, and when all the doors concerned are locked.

The denied exit mode shall be activable either for a part of the building (areas where nobody is), or for the entire building.

When the CMC receives a signal from an alarm system, the denied exit mode shall be able to be switched off automatically in the building area concerned.

The device to operate this function shall be designed to be operated by adequate access level, (see Annex D).

The blue visual signal on the CMC shall be permanent when it is activated for all exit system doors connected and blinking when only part of those exit system doors are concerned.

NOTE The denied exit mode may be activated from one or several central points (security guard with one or several CMCs), for the entire building or part of it.

Where applicable, the denied exit mode shall be manually activable by authorized people using a special key or a tool or similar means of identification. It shall provide a signal at the door (red flashing light). It can be linkable to a monitoring system in order to prevent access of the public to the building.

The locking element shall be energized and maintained energized when in denied exit mode and shall be released when not energized.

Compliance shall be verified by visual inspection, functional tests and/or measurements, described in 5.2.18.2.4.

The test result will be expressed by “Grade 0” or “Grade 1” according to 7.2.11.

4.2.18.2.5 Double time delay

The purpose of double time delay is to react after an initiating element has been activated to extend the initial time delay t1.

The double time delay may be activated from one or several central points (security guard with one or several CMCs), for one or several initiating exit controlled doors, in the time frame of the time delay t1 of a maximum 15 s, where security staff has to decide accordingly to a direct or a video monitoring view, to extend to time delay t2 to the maximum of 180s.

The device to operate this function shall be designed to be operated by adequate access level, (see Annex D).

For each door requesting, the audible signal and the red blinking visual signal shall be initiated, and the button dedicated to extend the time delay shall be triggered each time, and shall not allow the possibility to fix the button for an automatic time extension.

The visual signal shall:

— be at the minimum the double size of other signals, and shall indicate the following situations:

  — blink during t1 until the time delay t2 is activated;

  — be permanent during t2 time frame.

— automatically switch off at the end of t2 (same at the end of t1 if no double time delay is activated).

New incoming requests will follow the same rules.

Time delay shall not be reengaged after the time delay t1 and or t2 before the reset of the door concerned.

If a time delay t1 or t2 is active (for one or several doors), an action on the end time delay button shall switch off this time delay t1 or t2 at the same time for all the doors with time delay in progress.

When the CMC receives a signal from an alarm system, the time delay t1 or t2 shall be able to be switched off automatically in the building area concerned.

Compliance shall be verified by visual inspection, functional tests and/or measurements, described in 5.2.18.2.5.

The test result shall be expressed by “Grade 2” according to 7.2.10.

4.2.18.2.6 Monitoring status

The purpose is to show at any time the monitoring status of:

— exit doors in the locked or safe position;

— one or several CMC connected together;

— the optional connection to an alarm system.

The CMC shall include an audible signal. This might be activated or not by the installation set up.

The device to operate this function shall be designed to be operated by adequate access level, (see Annex E).

Each visual signal of monitoring status shall inform about the following situations:

— Door status: It shall show in green the safe unlocked status meaning the released locking element position and in red for secured and locked position. The visual signal shall be permanent when it is activated for all exit system connected doors and blinking when only part of those exit system doors are concerned.

— Alarm request: If an initiating element is activated, the CMC shall indicate by a yellow signal, to allow security staff to react. The visual signal shall be permanent when it is applied for all exit systems connected doors and blinking when only part of those exit system doors are concerned.

Test button: All monitoring signals shall be verified by a test button function which will light the CMC display elements and sound as long as the button is activated.

The device to operate this function shall be designed to be operated by adequate access level, (see Annex E).

— Optional audible signal: It is meant to alert the security staff on event of safety function, the CMC shall include a button to stop the audible signal, to be ready to identify the next event;

— CMC status: It shall show with the yellow signal the working status according to the following situations: permanent status to indicate a general failure of the CMC or a connected CMC and/or of remote connection path; and blinking visual signal when one or several exit system doors have been disconnected;

— Connection to alarm system: It shall show with the yellow signal the working status according to the following situations: permanent status to indicate a general failure of the communication and connection between CMC to the alarm system; and blinking visual signal when the alarm system has been disconnected.

Compliance shall be verified by visual inspection and functional tests described in 5.2.18.2.6.

4.2.18.2.7 Optional interface

It is an interface to other linked systems concerned for exit door management for information and receiving orders such as: Alarm System, Building Management, Visualization, Video control, access control.

Those shall not impair the safety functions of the CMC and / or the exit systems and their ability to release doors. They shall not affect the authorization level required in this standard and neither any safety functions.

Compliance shall be verified by visual inspection, functional tests described in 5.2.18.2.7.

4.2.18.2.8 Human interface

Push button shall be at the minimum of 18x18mm or Ø18mm.

Visual signal shall be at the minimum of 5x5mm or Ø5mm.

Buttons or signal indications shall get no more than two functions.

The lettering height shall be not less than 3mm.

The lettering shall be in the local language where the system is installed.

Test result shall be expressed by “CMC ok”.

4.2.19 Outside access device

The provision for a connection of an outside access device (key, cylinder, lever handle, knob, etc.) shall not, in any way, render the exit system inoperable from the inside, whether the outside access device is tested in the fully locked or unlocked position with the key removed. The installation instructions shall clearly indicate the approved configurations for outside access.

An outside access device that is not specified by the manufacturer as designed to be compatible with a specific exit system shall not be considered to be in conformity with this document.

When an outside access device is intended for use with a thumb turn cylinder or any other device, the size and any positioning of this device shall not interfere with the operation of the exit system from the inside.

Compliance shall be verified by 5.2.19.

Test result shall be expressed by “Outside access device ok”.

4.2.20 Security requirements

4.2.20.1 From outside

This requirement is intended to cover security protection from outside attack.

The security test does apply for the 3 situations:

— Electrical locking element only;

— Electrical locking element combined with mechanical exit devices according to EN 179 or EN 1125 as a “**technically independent components**” (according to 4.1.2);

— Electrically lockable operating elements (including the locking point).

When an exit system is tested in accordance with 5.2.20.1 it shall enable the door to remain when subjected to a force of:

— **Grade 2**: 1000 N;

— **Grade 3**: 2000 N;

— **Grade 4**: 3000 N;

— **Grade 5**: 5000 N;

— **Grade 6**: > 5000 N according to the defined product declaration.

The security grade obtained by the system will be the highest level achieved either by:

— electrical locking elements;

— or electrically lockable operating elements;

— or combination of electrical locking element with mechanical exit device, when separate measurement shall be conducted for the electrical locking element and the exit device.

Compliance shall be verified by 5.2.20.1.

Test result shall be expressed by “Grade X” according to 7.2.8.

4.2.20.2 From inside

This requirement is intended to cover security protection from inside attack and does apply only to electrical locking elements or electrically lockable operating elements.

This does not apply to mechanical operating elements, which have been already tested to their respective standards (e.g. EN 1125 or EN 179).

The test results from the security from outside for the electrical locking element can be used to fulfil this requirement, due to the fact that the electrical locking element locks the door to the frame, and there is no difference from inside to outside.

When an exit system is tested in accordance with 5.2.20.2 it shall enable the door to remain secured solely by means of electrical locking elements or electrically lockable operating elements when subjected to a force of:

— **Grade 1**: 500 N;

— **Grade 2**: 1000 N;

— **Grade 3**: 2000 N;

— **Grade 4**: 3000 N;

— **Grade 5**: 5000 N;

— **Grade 6**: > 5000 N according to the defined product declaration.

When the exit system includes several electrical locking element, the test shall be conducted for each separate electrical locking point.

Compliance shall be verified by 5.2.20.2.

Test result shall be expressed by “Grade Y” according to 7.2.9.

4.3 Self-closing ability C (for fire/smoke doors)

An exit system shall reengage fully the electrical locking element into the secured position in order to avoid the use of chains, bolts, etc. to provide extra security without jeopardizing the ability to release.

An electrical locking element with mechanical reengaging shall be tested in accordance with Reengagement tests of electrical locking element of 5.3. The force required to reengage shall not exceed 50 N.

When an electrically controlled exit system is combined with an independent mechanical exit device to EN 1125 or EN 179, this mechanical exit device shall be disengaged for the purpose of this test. The reengagement force of the electrical locking element shall be recorded and shall be part of the product information.

If an exit system intended for use on self-relatching smoke/fire-resisting doors allows for automatic rebolting, it shall be designed to avoid accidental rebolting while the door is opened, preventing the self-closing of the door.

NOTE To avoid any misuse of the exit systems, it is important that exit systems can be installed on either latched or unlatched fire resisting doorsets, unless specifically defined.

Compliance shall be verified by the test methods described in 5.3.

Test result shall be expressed by “Grade X” according to 7.2.4.

4.4 Suitability for use on fire and smoke doors

An exit system intended for use on smoke/fire-resisting door assemblies shall meet the following requirements in accordance with its intended grade described in 7.2.5.

Grade A: exit systems of Grade A representative of their type shall have been subjected to a successful evaluation proving their suitability for use on smoke doors. For this, all parts of the exit system that are responsible for keeping the door in its closed position shall be made out of material with a melting point of not less than 300 °C. If the exit system is equipped with a latch bolt and the latch bolt could be the only part of the exit system that keeps a smoke door in its closed position, then the projection of the latch bolt shall be at least 10 mm.

NOTE 1 Where the latching of the exit system relies on an emergency exit device to EN 179 or a panic exit device to EN 1125 (see Annex G) classified to Grade A suitability for smoke doors, it can be assumed that the exit system is meeting this requirement as long as the other elements do not affect the self-closing and latching of the system.

Alternatively, the suitability for use on smoke-resisting doors shall be determined by a successful test conducted in accordance with EN 1634-3.

Installation instructions shall ensure that the engagement of the latch bolt inside the locking plate is not less than 6 mm.

Grade B: Exit systems of grades B representative of their type and including any outside access devices intended for fire door use shall have been subjected to a successful fire test conducted at least on the exposed face of the door in accordance with EN 1634-1 to prove the contribution of the exit system to the fire resistance of the complete door assembly. It is not required for the exit system to be operable after such a fire test.

NOTE 2 Although the exit systems referred to in this annex are suitable for use with smoke/fire-resisting door assemblies, the safety aspect and ease of escape as described in the introduction to this European Standard remains of the utmost importance.

Any additional elements installed on the fire test specimen, and which could influence the test result, shall be clearly identified in the fire test report and shall be included in the product information such that the limitations to the scope of fire performance approval for the electrically controlled exit system can be established.

Any additional locking or securing means used on the fire test specimen shall not conflict with the requirements of 4.2.

During fire/smoke tests, the exit system shall not depend on power supply to maintain the door in the closed position.

Details of the inclusion or otherwise of a dogging mechanism in the fire test samples shall form a part of the final fire test report.

Compliance shall be verified by the test methods of EN 1634-1 or EN 1634-2, and EN 1634-3.

Test result shall be expressed by “Grade X” according to 7.2.5.

4.5 Control of Dangerous substances

National regulations on dangerous substances may require verification and declaration on release, and sometimes content, when construction products covered by this standard are placed on those markets. In the absence of European harmonized test methods, verification and declaration on release/content should be done taking into account national provisions in the place of use.

NOTE An informative database covering European and national provisions on dangerous substances is available at the Construction website on EUROPA accessed through: http://ec.europa.eu/growth/tools-databases/cp-ds/index_en.htm.

4.6 Durability of ability to release (against ageing and degradation for doors on escape routes

4.6.1 General

When an exit system is tested in accordance with 5.6.1, each of its elements shall complete the number of cycles according to Table 3.

After the test, the exit system shall comply with the requirements of 4.2.

When the initiating element is not incorporated in the operating element but is a separate initiating element, i.e. installed on a door frame, then the test cycles for the initiating element shall be reduced according to Table 3.

After the test, the separate initiating element shall comply with the requirements of 4.2.

Table 3 —Number of cycles

Grade	Number of cycles of exit system, where the initiating element is not incorporated in the operating element	Number of cycles of emergency initiating element
6	100 000	6 000
7	200 000	6 000
8	500 000	6 000
9	1 000 000	6 000
Grade	**Number of cycles of exit system, where the initiating element is incorporated in the operating element**	**Number of cycles of intensely used initiating element**
6	100 000	100 000
7	200 000	200 000
8	500 000	500 000
9	1 000 000	1000 000

When an exit system equipped with a deadbolt only thrown by a key for additional security is tested in accordance with 5.6, the cycling test of the deadbolt shall consist of:

— 25 000 cycles to achieve grade 6;

— 50 000 cycles to achieve grade 7;

— 125 000 cycles to achieve grade 8;

— 250 000 cycles to achieve grade 9.

An exit system may be designed to incorporate an additional deadbolt thrown by a key, used only at certain period of time for additional security. The release function shall be tested with any deadbolt thrown.

The durability of the deadbolt does not need to be tested to same number of cycles as either the regular latch bolt or an automatic relatching device, or an automatic deadbolt.

Test result shall be expressed by “Grade X” according to 7.2.3.

4.6.2 Abuse resistance of electrical locking element

When the electrical locking element is tested in accordance with 5.6.2 it shall withstand a force of 500 N.

After the test, the exit system shall pass the release test of 5.2.7.

Test result shall be expressed by “withstand abuse force of 500 N”.

4.6.3 Abuse resistance of initiating element

When the initiating element is tested in accordance with 5.6.3, and depending on the projection of the initiating element, different abuse side forces are given in Table 4:

Table 4 —Abuse resistance of initiating element

Overall projection of the push button or the box where the push button is fixed (for example, from the surface of the wall or door), excluding any removable cover.	Initiating element shall withstand a side force of
< = 30 mm	100 N
> 30 mm and < = 100 mm	300 N
> 100 mm	500 N

Test result shall be expressed by “withstand abuse force of 100/300 N or 500 N”.

4.6.4 Abuse resistance of electrically lockable operating element

When an electrically lockable operating element is tested in accordance with 5.6.4, it shall withstand the same force according to the grade of the security requirements from inside (see 4.2.20.2).

After the test, the exit system shall meet the requirement of 4.2.6.

The above verification shall also apply where local requirements can specify higher abuse forces.

Test result shall be expressed by “withstand abuse force of xxxN”.

4.6.5 Environmental requirements - Temperature range requirement

Materials selected in the design of an exit system shall be suitable for the operation of the exit system between temperatures of −10 °C and +55 °C. The maximum release force at −10 °C and at +55 °C shall not exceed +25 % in excess of the release force measured at 20 °C.

If a manufacturer claims suitability for a wider temperature range, this shall be verified.

This requirement shall be verified by the test specified in 5.6.5 (Temperature).

Test result shall be expressed by “tested between −10 and +55°C”.

4.6.6 Environmental requirements - Corrosion resistance requirement

The initiating element, the locking element, and/or any operating element which is electrically lockable shall be able to withstand the long term effects of a corrosive environment without impairing the ability to release of the electrically controlled exit system, and shall meet at least the grades given in Table 5, in accordance with EN 1670.

Table 5 — Corrosion resistance requirement

Grade for corrosion resistance, humidity and IP protection (digit 6 of system classification)	Grade according to EN 1670
0 indoor zone	0
1 indoor zone, where condensation may occur	1 (24 h)
2 outdoor zone	3 (96 h)

If the controlling element is integrated with any other element, then it shall be able to withstand the long term effects of a corrosive environment without impairing the ability to release of the electrically controlled exit system, and shall meet at least upper listed grades in accordance with EN 1670.

The requirement does not apply to the installation wiring connecting the above elements. This requirement is intended to verify the correct functioning of the exit system; no evaluation of surface finish or appearance is required.

Compliance is checked by the test method of 5.6.6.

Test result shall be expressed by “Grade X” according to 7.2.7.

4.6.7 Environmental requirements - Dry Heat resistance requirement

The initiating element, the controlling element, the locking element, and/or any operating element which is electrically lockable shall be able to withstand the effects of a dry heat environment without impairing the ability to release of the electrically controlled exit system. The requirement does not apply to the installation wiring connecting the above elements.

The electrical exit system shall fulfil the test described into 5.6.7, referring to EN 60068-2-2:2007 in which:

— Test procedure is type Be;

— Condition is 55 °C;

— Duration is 16 h.

Test result shall be expressed by “Dry Heat resistant”.

4.6.8 Environmental requirements - Cold resistance requirement

The initiating element, the controlling element, the locking element, and/or any operating element which is electrically lockable shall be able to withstand the effects of a cold environment without

impairing the ability to release of the electrically controlled exit system. The requirement does not apply to the installation wiring connecting the above elements.

The electrical exit system shall be able to function correctly at low ambient temperatures of −10°, which may occur for short periods in the anticipated service environment.

The test refer to EN 60068-2-1:2007,

— Test procedure type Ae;

— Condition −10 °C;

— Duration 16 h.

Compliance is checked by the test method of 5.6.8.

Test result shall be expressed by “Cold resistant”.

4.6.9 Environmental requirements - Damp heat cyclic (12h + 12h) resistance requirement

The initiating element, the controlling element, the locking element, and/or any operating element which is electrically lockable shall pass or not the test described in 5.6.9, according to Table 6.

Table 6 —Damp heat cyclic resistance requirement

Grade for corrosion resistance, humidity and IP protection (digit 6 of system classification)	5.6.9 Damp heat cycling test
0 indoor zone	no
1 indoor zone, where condensation may occur	yes
2 outdoor zone	yes

To be able to withstand the effects of a high humidity when combined with cyclic temperature changes without impairing the ability to release of the electrically controlled exit system. The requirement does not apply to the installation wiring connecting the above elements.

The equipment shall be able to function correctly in a damp heat environment, which may occur for short periods in the anticipated service environment.

Compliance is checked by the test method of 5.6.9.

Test result shall be expressed by “Grade X” according to 7.2.7.

4.6.10 Environmental requirements - Impact resistance requirement

The purpose of this requirement is to simulate normal use of the system and ensure that impacts have no negative influence on the function of the system.

The requirements given in Table 7 shall be fulfilled.

Table 7 —Abuse resistance of the operating surface of the initiating element

Type of **operating surface**	Test according to 5.6.10.1 and 5.6.10.2 with
Protection cover **against unintentional** actuating with a flexible actuating area with less than 40 mm diameter	h = 100 mm ± 1 mm
Projecting actuating device or with protection cover **against unintentional** actuating with a flexible actuating area with more than 40 mm diameter	h = 320 mm ± 2 mm

To avoid an interrupt of the time delay t1/t2 or denied exit mode with a mechanical impact the system shall withstand the requirements given in Table 8:

Table 8 —Abuse resistance against shock

Element	**Direction**	**Test according 5.6.10.3 with**
Initiating element: Protection cover **against unintentional** actuating with a flexible actuating area with less than 40 mm diameter	of activation	h = 100 mm ± 1 mm
Initiating element: Projecting actuating device or with protection cover **against unintentional** actuating with a flexible actuating area with more than 40 mm diameter	of activation	h = 320 mm ± 2 mm
Combined initiating and operating element	of activation	h = 630 mm ± 2 mm
electrical locking element	rim installation in exit direction: at the electrical locking element in exit direction mortise installation or installation not in exit direction: at the door near by the electrical locking element	h = 320 mm ± 2 mm
electrically lockable operating element	of activation	h = 630 mm ± 2 mm
Controlling element If **determined** to install in, on or unprotected by the door.	of **mounting surface**	h = 320 mm ± 2 mm

For each declared function t1, t2 and/or denied exit mode shall the test conducted, if necessary depending of the construction.

The above verification shall also apply where local requirements can specify higher abuse forces.

Compliance is checked by the test method of 5.6.10.

Test result shall be expressed by “Impact resistant”.

4.6.11 Environmental requirements - Rated voltage requirements

A locking, controlling, or initiating element manufactured to this standard shall be designed for rated voltages of maximum 48 V DC.

The values of power supply shall be as indicated in Table 9.

Table 9 —Power supplies

	Mains supplies	**Other supplies**
Supply voltage	230 V AC[a] ± 15 %	rated voltage ± 15 %
[a] European nominal mains voltage is 230 V.		

The tests shall be carried out with the values of power supply as indicated in Table 10.

Table 10 —Test requirements overview

Test procedures	**Test values**
4.2.10 Release requirements after power supply failure	Nominal voltage −15 % Verify the ability of release by lower voltage
5.2 Release function test - Input signal from the Alarm system such as an alarm system	Nominal voltage
5.2.7 Release force test - Door not under pressure	Nominal voltage +15 %
5.2.8 Release force test - Door under pressure	Nominal voltage +15 %
5.2.6 Test of failsafe function and failure of liaison and transmission paths, and release force test of initiating element	Nominal voltage +15 %
5.2.10 Release tests after power supply failure	Nominal voltage −15 % Reducing voltage by 10 % until system can reset
5.4 Durability tests	Nominal voltage +15 %
5.6.3 Abuse resistance tests	Nominal voltage
5.2.20 Security tests	Nominal voltage (±2 %)
5.3.Reengagement tests of electrical locking element	Nominal voltage
5.6.5 Temperature test	Nominal voltage +15 %
5.6.6 Corrosion test	Not energized
5.6.7 Dry heat test	Nominal voltage
5.6.8 Cold test	Nominal voltage
5.6.9 Damp heat cyclic test	Nominal voltage +15 %
5.6.10 Impact test	Nominal voltage
5.6.11 Supply voltage variations test	Nominal voltage Nominal voltage +15 % Nominal voltage −15 %

The power consumption shall be declared in the product information to check the suitability of the system to the intended power supply.

NOTE It is advisable for environmental reasons to reduce the maximum value to 4 W for the complete system.

Compliance shall be verified by 5.6.11 and checking the rated voltage declared in the installation instruction.

Test result shall be expressed by “Rated voltage checked”.

4.6.12 Electrical hazards safety requirements (Low voltage)

The exit system shall be so designed and constructed that, under all conditions of normal use and under a likely fault condition, it protects against the risk of personal injury from electric shock and other hazards, and against serious fire originating in the equipment.

Compliance is checked by the test methods of 5.6.12.

Relevant tests which have been already passed won’t be repeated if the test report can be presented.

Test result shall be expressed by “Safe against electrical hazards”.

4.6.13 Environmental requirements - Electromagnetic compatibility (EMC) requirements and/or Radio and telecommunication terminal equipment (R&TTE)

4.6.13.1 Emission

The exit system shall provide a given level of emission. The exit system shall comply with the following provisions:

— EN 61000-6-3, *Electromagnetic compatibility – Generic standard for emission for commercial and light industry environment*;

— EN 55022, *Limits and methods of measurements of radio disturbances – characteristics of information technology equipment*.

In addition, where power supply is part of the exit system, this shall comply with the following provisions:

— EN 61000-3-2, *Testing and measurement techniques – Limits – Limits for harmonic current emissions;*

— EN 61000-3-3, *Testing and measurement techniques – Environment – Compatibility levels for low frequency conducted disturbances and signalling in public low-voltage power supply systems.*

Compliance is checked by the test methods of 5.6.13.

4.6.13.2 Immunity

Because of its safety objectives, the exit system shall provide a high level of immunity. Where applicable, the exit system shall comply with the following requirements:

— EN 61000-6-2, *Electromagnetic compatibility – Generic standard for immunity for industrial environment.*

In addition, the following standards can be used:

— EN 61000-4-2, *Testing and measurement techniques – Electrostatic discharge immunity test*;

— EN 61000-4-3, *Testing and measurement techniques – Radiofrequency magnetic fields*;

— EN 61000-4-4, *EMC Testing and measurement techniques – Electrical fast transient - Burst immunity test*;

— EN 61000-4-5, *EMC Testing and measurement techniques – Surge immunity test*;

— EN 61000-4-6, *EMC Testing and measurement techniques – Immunity to conducted disturbances, inducted by radiofrequency fields*;

— EN 61000-4-8, *EMC Testing and measurement techniques – Power frequency magnetic field immunity test*.

In addition, where power supply is part of the exit system, this shall comply with the following requirements:

— EN 61000-4-11, *EMC Testing and measurement techniques – Voltage dips, short interruptions and voltage variations immunity tests*.

NOTE Some standards cover specific components (i.e. radio components or microcontrollers) and may not be applicable to all products.

The immunity and performance criteria shall be as indicated in Table 11.

Table 11 —Immunity, performance criteria

criteria	assessment
A	Generic immunity standard, short form: The apparatus shall continue to operate as intended.
B	Generic immunity standard, short form: The apparatus shall continue to operate as intended after the test. No degradation of performance or loss of function is allowed.
C	Generic immunity standard, short form: Temporary loss of function is allowed, provided the function is self-recoverable or can be restored by the operation of the controls.
D	The apparatus shall continue to operate as intended. No degradation of performance or loss of function is allowed, except failing safe.

If the minimum level of performance loss is not specified by the manufacturer then it may be derived from the product documentation.

Where the additional functions for electrically control exit system listed in Table 12 are also provided, these functions shall lead at least at the same level of immunity or higher than those in Table 11.

Table 12 — Additional functions for electrically controlled exit systems

criteria	Required functions
D	Ability to release when operate the initiating element
D	Limitation of maximum time delay t1/t2
D	Change of operating mode if not requested to do so, especially from the release mode or unlocked position to the locked mode or the denied exit mode
D	Start of time delay t1 or t2 without command
D	Safety connection to the CMC
B	Change of inputs and outputs that could be interpreted by other external elements as a change in the status
A	Release signal of an alarm system
B	Remote connection to the CMC
B	Displayed information (i.e. flickering, flashing, buzzer, etc.)

Compliance is checked by the test methods of 5.6.13.

Test result shall be expressed by “EMC and/or R&TTE compliant”

4.6.14 Environmental requirements – IP Protection against solid foreign objects and ingress of water and dust

The exit system shall provide a level of protection against dust and water. The initiating, controlling and locking elements of the exit system shall comply with the following provisions. Compliance is checked by the test methods of 5.6.14.

The IP Protection shall comply with Table 13.

Table 13 —IP Protection

Grade for corrosion resistance, humidity and IP protection (digit 6 of system classification)	EN 60529 – Degrees of protection provided by enclosures (IP code)
0 indoor zone	IP 30
1 indoor zone, where condensation may occur	IP 32
2 outdoor zone	IP 44

Test result shall be expressed by “Grade X” according to 7.2.7.

4.7 Durability of self-closing ability C against ageing and degradation (for fire/smoke doors)

When an exit system is tested in accordance with 5.7, each of its elements shall complete the number of cycles according to Table 3.

After the test, the exit system shall comply with the requirements of 4.3.

Test result shall be expressed by “Grade X” according to 7.2.3.

5 Testing, assessment and sampling methods

5.1 General

5.1.1 Test methods

Any electrically controlled exit system within any one model range having significantly different working components, or working components of significantly different materials shall be separately tested.

NOTE 1 This may involve examination of the construction of the various products involved, and pre-testing of certain attributes in order to determine the test samples representing the product range.

NOTE 2 To avoid duplication of testing when applying for extended application of a previously approved system, for example devices modified for increased door mass and dimensions (3rd character, grade 7), only those tests related to the modified characteristics would normally need to be repeated.

Electrically controlled exit systems using separate locking elements shall be tested together with the locking element specified by the manufacturer, irrespective of whether or not that locking element is a mortise lock.

Four test samples shall be used for testing to this European standard:

— Sample A: Design verification and performance tests (Test door 1);

— Sample B: Electrical safety tests and Environmental performance tests (Test door 2);

— Sample C: Reference or further tests;

— Samples D and E: Suitability for use on fire resisting doorsets (where applicable).

Failure of any one test constitutes failure of the entire test. In the case of any one test sample failure the relevant test sequence may be repeated using sample C.

The exit system shall be fitted to the test door in accordance with the manufacturer's instructions.

If an exit system is to be used on single leaf doors only, it shall be tested on the test door described in 5.1.2.2.2, or on the test door described in 5.1.2.2.3 by using only one of the two leaves, with the unused leaf being clamped secured.

If an exit system is to be used on double doorsets, it shall be tested only on the test door described in 5.1.2.2.3.

Throughout these tests, the following tolerances on values shall apply, unless otherwise stated:

– angular position in degrees ±2°;
– force, in newtons ±2 %;
– length, in millimetres ±2 %;
– mass, in kilograms ±5 %.
– time, in seconds ±10 %
– voltage in volts ±2 %

The ambient temperature of the test environment shall be controlled throughout the tests to between + 15 °C and + 30 °C. The environment shall be substantially free from draughts.

5.1.2 Test apparatus

5.1.2.1 General

Instruments with an accuracy of 1,5 % of measured values, or better shall be used for measurements in accordance with these test methods.

Any rates of force increase are calibrated on a blocked door prior to carrying out the tests.

All cycle testing equipment shall include means of recording the number of cycles attained.

5.1.2.2 Test door 1

5.1.2.2.1 General

This test door shall be used for release tests, durability tests, abuse resistance tests and security tests.

5.1.2.2.2 Single leaf test door

For a single leaf test door, the test door leaf shall be 2 100 mm high and 1 100 mm wide. It shall have means of attaching weights so that the door mass is in accordance with the intended classification in kilograms ± 2 %. The test door and its frame shall be made of material of sufficient rigidity (i.e. welded steel or aluminium profiles) such that any distortion taking place during the test sequence shall be no more than 5 mm at any position. Actuating means shall be provided to enable the door to be opened solely by operating the initiating element of the exit system under test.

For exit system intended for door leaves exceeding these dimensions and/or mass, a specific test door according to the dimensions and mass claimed by the manufacturer, shall be used. See 4.2.12.

5.1.2.2.3 Double leaf test door

For a double leaf test door, the test door leaves shall each be 2 100 mm high and 1 100 mm wide. They shall have means of attaching weights so that the door mass is in accordance with the intended classification in kilograms ± 2 %. The test door leaves and their frames shall be made of material of sufficient rigidity (i.e. welded steel or aluminium profiles) such that any distortion taking place during the test sequence shall be no more than 5 mm at any position. Actuating means shall be provided to enable either door leaf to be opened solely by operating the respective initiating element of the exit system under test. Provision shall be made for an astragal (or rebated edge) to be fitted to the external face of the first opening leaf. The effective gap between the two leaves shall be 6 mm.

For exit systems intended for door leaves exceeding these dimensions and/or mass a specific test door according to the dimensions and mass claimed by the manufacturer, shall be used. See 4.2.12.

5.1.2.2.4 Centre of gravity

The position of the centre of gravity shall be nominally at the mid-height position of the test door leaf and 500 mm from the vertical axis of the hinges.

For exit systems intended for door leaves exceeding these dimensions and/or mass (door mass grade 7), the centre of gravity shall be positioned according to the manufacturer’s specifications.

5.1.2.2.5 Construction

The test door shall be mounted vertically on hinges or other bearings attached to the rigid frame. The moment of friction shall not exceed 2 Nm in either direction. The axis of rotation shall be positioned 65 mm from the inside face of the test door leaf measured perpendicular to the leaf. See Figure 4.

Dimensions in millimetres

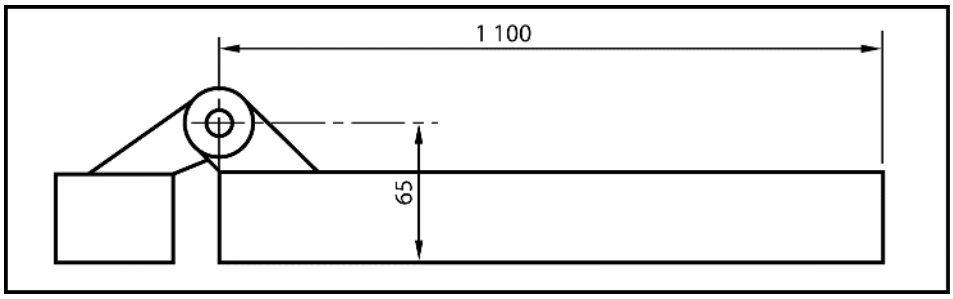


Figure 4 —Mounting of test door and frame

The manufacturer may specify any reinforcement or special preparation to the door provided it does not compromise any of the criteria of this clause. It has to be specified and mentioned by the manufacturer in the installation instructions.

5.1.2.3 Test door 2

This test door shall be used for environmental tests. It shall be at least 750 mm wide × 400 mm high.

5.1.3 Procedures

Where an exit system contains elements that are already proven to EN 1125 or EN 179 standards, those elements shall nevertheless be subject to the specific requirements of this standard.

The configuration of the system to be tested will be agreed between the manufacturer and the test laboratory, in advance of any testing. The elements composing the system to be tested will be chosen among the list given by the manufacturer (see A.2).

The performance requirements shall be tested in the order detailed in Annex C and as defined below:

— Sample A: Design verification and performance tests;

— Sample B: Electrical safety tests and environmental performance tests;

— Sample C: Reference or further tests;

— Sample D and E: Suitability for use on fire resisting doorsets (both sides).

Prior to the start of the test sequence of sample A (design and mechanical performance), it is permissible to make any installation adjustments to the exit system or its fixings in accordance with the manufacturer's instructions.

A test report should be completed according to general testing procedures, i.e. EN ISO IEC 17025, 5.10.

5.2 Tests for Ability to Release

5.2.1 Test for number of operations to release

5.2.1.1 One operation

If the system consists of an initiating element integrated in the operating element, and an electrical locking element, then the test procedure will be the following:

— Operation 1: Activate the operation element (and therefore the initiating element) and maintain it until the electrical locking element is released (after less than 1 s or after time delay set).

If the system consists of an iniating element and an electrical locking element (without any operating element), then the test procedure will be the following:

— Operation 1: Activate the initiating element and check if the electrical locking element is released (after less than 1 s or after time delay set).

5.2.1.2 Two operations

If the system consists of an initiating element separated from the operating element, and an electrical locking element, then both following test procedures will be checked:

Test procedure 1:

— Operation 1: Activate the initiating element;

— Operation 2: Activate the operating element and maintain it until the electrical locking element is released (after less than 1 s or after time delay set).

Test procedure 2:

— Operation 1: Activate the operating element and maintain it;

— Operation 2: Activate the initiating element and check if the electrical locking element is released (after less than 1 s or after time delay set).

5.2.2 Test for operation of initiating element

Operate the initiating element and check if its movement is either:

— horizontally or parallel to the door face and downwards or

— horizontally and downwards.

5.2.3 Release function test - Input signal from the Alarm system such as an alarm system (sample A)

Basic of the test is the definition of the alarm signal (such as an alarm system) and the initial status.

A simulation of a signal from an alarm system is also possible.

According to the requirements of 4.2.3, the exit system, energized at rated voltage, shall be tested using steps given in Table 14 and Table 15.

Table 14 —Release function test (in standard conditions)

Test procedure	Acceptance criteria
Start position: put the system into electrically locked status, the alarm system is connected and working or simulated according to manufacturer's instructions.	
No time delay, start position	
Send an alarm from the alarm system.	The system changes immediately to the electrically unlocked status
Close the door if it has been opened	
Stop the alarm	The system changes immediately to the electrically locked status
Time delay t1 (according to 4.2.3, the test shall be repeated for each mode a) and b) when applicable)	
When t1 can be set, send an alarm from the alarm system during t1	t1 Time delay cancelled
Release mode a): Release mode b): operate the initiating element	The system changes immediately to the electrically unlocked status
Close the door if it has been opened	
Stop the alarm	The system changes immediately to the electrically locked status
Time delay t2 (according to 4.2.3, the test shall be repeated for each mode a) and b) when applicable)	
Send a alarm signal from the alarm system during t2 if the exit system has the ability	t2 Time delay cancelled
Release mode a): Release mode b): operate the initiating element	The system changes immediately to the electrically unlocked status
Close the door if it has been opened	
Stop the alarm	The system changes immediately to the electrically locked status
Denied exit mode if the exit system has the ability	
Send a signal from the alarm system in the denied mode	the system changes immediately to the electrically unlocked status or remains in electrically locked status, depending on preselected mode in the system.(see note below)
	denied exit mode switched off
Stop the alarm	Electrical locking element relocked (if the door is closed and lockable)

Table 15 —Release function test (in failure condition)

Test procedure	Acceptance criteria
Earth	
Put the input or line on earth	If this has an influence of the ability to release when receiving an alarm signal, the system has to change immediately to the electrically unlocked status
Send a signal from the alarm system	The system changes immediately to the electrically unlocked status
Stop the alarm	Electrical locking element relocked (if the door is closed and lockable)
Remove put the input or line on earth	The system has to fulfil all the listed tests in 5.2
Short circuit	
Make a short circuit on the input or line	If this has an influence of the ability to release when receiving an alarm signal, the system has to change immediately to the electrically unlocked status
Send a signal from the alarm system	Immediately release of the Electrical locking element
Stop the alarm	Electrical locking element relocking (if the door is closed and lockable)
Make a short circuit on the input or line	The system has to fulfil all the listed tests in 5.2
Line disconnection	
Disconnect the line to alarm system or cut a wire	If this has an influence of the ability to release when receiving an alarm signal, the system has to change immediately to the electrically unlocked status
Send a signal from the alarm system	Immediately release of the Electrical locking element
Stop the alarm	Electrical locking element relocking (if the door is closed and lockable)
Connect the line in accordance with the instructions	The system has to fulfil all the listed tests in 5.2

NOTE In some situations, it may be safe to remain the door locked.

Repeat the all test procedure for each type of signal declared in the product information or release modes available to be proceeded.

5.2.4 Tests for resetting conditions

Place the exit system in the conditions described in Table 1. Verify that the electrical locking element is released. Check if the resetting is completed in the different listed possibilities (at the door, from the CMC and automatically), by relocking the electrical locking element.

5.2.5 Test for operating element

If the operating element has not been tested previously to EN 179 or EN 1125, then those tests will have to be performed.

5.2.6 Test of fail safe function and failure of liaison and transmission paths, and release force test of initiating element (Sample A)

According to the requirements of 4.2.6.1 and 4.2.9 conduct the following test sequence:

a) energize the exit system at the rated voltage plus 15 %;

b) check if the electric locking element has locked the door;

c) operate the initiating element, verify the release force according to 4.2.9, and maintain it in the release position; If there is a cover over the initiating button, apply the force to the cover;

d) check the effectiveness of the immediate door release or of the release after the time delay when applicable;

e) verify each time that the initiating element gives an electrical release signal to the controlling element.

This test shall be conducted three times.

5.2.7 Release force test - Door not under pressure (Sample A)

5.2.7.1 General

According to the requirements of 4.2.7, the exit system shall be tested using steps given in Table 16 and Table 17:

5.2.7.2 Electrical locking element

Table 16 —Release force test for Electrical locking element – Door not under pressure

Test procedure	Acceptance criteria
Start position: The door is closed.	
Energize the exit system at the nominal voltage plus 15 %	The door is electrically locked
When the electrically controlled exit system incorporates an operating element, operate that element and maintain it in the released position.	
Apply a force of 4.2.7 in the direction of opening in a radius of 100mm of the electric locking point	
Switch off the electric power of the electric locking element	The electric locking element is released within 1 s

5.2.7.3 Electrically lockable operating elements

Where applicable, apply the relevant force of 4.2.7 with the electrically lockable operating element in its locked state, as follows:

a) Lever handle operation: 70N to the lever handle in the direction to enable release and at 25 mm from the free end of the lever handle;

b) Push pad operation: 150N to a push pad in the direction to enable release and within 25 mm from the furthest point away from the axis or the bearing point of the push pad;

c) Bar operation: 80N to a bar in the direction to enable release at three positions along the bar, midpoint and within a maximum of 25 mm from each bar end.

Table 17 —Release force test for electrically lockable operating elements - Door not under pressure

Test procedure	Acceptance criteria
Start position: The door is closed.	
Energize the exit system at the nominal voltage plus 15 %	The door is electrically locked
Apply a force of 4.2.7 like described with a rate of 10 N/s ± 10 %	
Switch off the electric power of the electric locking element	The electric locked operating element is unlocked after maximum 1 s

5.2.8 Release force test - Door under pressure (Sample A)

5.2.8.1 General

According to the requirements of 4.2.8, the exit system shall be tested using steps given in Table 18:

5.2.8.2 Electrical locking element

Table 18 —Release force test for Electrical locking element – Door under pressure

Test procedure	Acceptance criteria
Start position: The door is closed and locked.	
Energize the exit system at the rated voltage plus 15 %	The door is electrically locked
When the electrically controlled exit system incorporates an exit device according EN 1125 / EN 179, operate that element and maintain it in the released position.	
Apply a force of 4.2.8 in the direction of opening in a radius of 100mm of the electric locking point with a rate of 25 N/s ± 10 %	
Switch off the electric power of the electric locking element	The electric locked operating element is unlocked after maximum 1 s

5.2.8.3 Electrically lockable operating element

Where applicable, apply the relevant force of 4.2.8 (1 000 N) with the electrically lockable operating element in its locked state, as follows:

a) If lever handle operation:

The force of 1000 N shall be applied at 100 mm from the leading edge of the door and 100 mm above the pivot point of the lever handle. Additionally, a vertical force of 500 N shall be applied in the direction to enable release and at 25 mm from the free end of the lever handle.

b) If Push pad operation:

The force of 1000 N shall be applied to the push pad in the direction to enable release and within 25 mm from the furthest point away from the axis or the bearing point of the push pad.

c) If Bar operation:

The force of 1000 N shall be applied to the bar in the direction to enable release at three positions along the bar, midpoint and within a maximum of 25 mm from each bar end.

Table 19 —Release force test for electrically lockable operating elements - Door under pressure

Test procedure	Acceptance criteria
Start position: The door is closed and locked.	
Energize the exit system at the rated voltage plus 15 %	The door is electrically locked
Apply a force of 4.2.8 like described above with a rate of 25 N/s ± 20 % (and the force of 500 N if lever handle)	
Switch off the electric power of the electric locking element	The electrically lockable operating element is unlocked after maximum 1 s and the door is visually released.

5.2.9 Release from the Initiating element

According to 4.2.9, the test will consist in measuring the force needed for the initiating element to generate the signal to the controlling element, according to its type.

5.2.10 Release tests after power supply failure (Sample A)

According to the requirements of 4.2.10, the exit system shall be tested using the following steps:

a) energize the exit system at minimum voltage (U min);

b) operate initiating element;

c) verify the locking element releases immediately (this may be after time delay when applicable);

d) reset the exit system;

e) reduce supply voltage by 10 % of U min;

f) repeat b), c), d) and e) until the exit system cannot be reset;

g) increase the supply voltage back to minimum voltage (U min);

h) operate initiating element;

i) verify the locking element releases immediately (this may be after time delay when applicable).

5.2.11 Verification of dimensions and design

In order to verify the requirements of 4.2.11, dimensions or designs shall be checked with adequate tools, visual inspection and/or functional tests.

5.2.12 Verification of Door mass and door dimensions

Beyond the limits defined in 4.2.12, the tests shall be performed in the worst conditions, for maximum door mass, width and height.

a) **door mass over 200 kg:** durability test according to 5.6 and the release force tests according to 5.2.7 and 5.2.8;

b) **door width over 1 320 mm**:

1) horizontal bar operation: release tests according to 5.2.7 and 5.2.8 and the abuse resistance test according to EN 1125 or 5.2.8.3, c), if the system has an electrically lockable operating bar;

2) lever handle or push pad operation: no further test required;

3) initiating element not incorporated within an operating element no further test required.

c) **door height over 2 520 mm**: release tests according to 5.2.7 and 5.2.8 and the abuse resistance tests of the vertical rods according to EN 179, or EN 1125. Either perform the test with the intended door height or perform the test on test doors 2 100 mm high but with weights added to the vertical rods to ensure that the vertical rods have the same mass that they would have on the door for which the device is specified. In this case the longest unsupported length of vertical rod, at the midpoint of which the abuse force is applied, shall be not less than the one of the door for which the device is intended.

The test apparatus shall be provided by the test laboratory.

Where it is obvious to the testing laboratory that the performance of the locking element is not affected by the dimensions of the door, a suitably weighted standard test door (according to the mass intended) can be used. In this case, full details of the test carried out shall be included in the test report.

5.2.13 Verification of keepers

According to the requirements of 4.2.13, verification shall be performed by visual inspection, functional tests and measurements of the keepers.

5.2.14 Verification of Initiating element with cover

According to the requirements of 4.2.14, verification shall be performed by visual inspection of the initiating element.

5.2.15 Test for finger trapping

According to the requirements of 4.2.15, any gap shall not trap a test rod (of 10 mm diameter by 100 mm in length) by its 10 mm diameter in any position during the operation of any element of the exit system.

This test concerns only movements in the direction of exit, not on return.

5.2.16 Verification of pictograms

According to the requirements of 4.2.16, verification shall be performed by visual inspection of the pictograms.

5.2.17 Release test according to time delay (Sample A)

5.2.17.1 General

According to the requirements of 4.2.17, the test sequence shall be tested using steps given in Table 20, Table 21, Table 22 and Table 23.

The test sequence shall be conducted three times. When it is possible to change the function of the product from one Grade to another during the installation or operating mode, the test shall be conducted for all possible Grades.

The test lab shall verify by product documentation and visual inspection that the fail safe principle is fulfilled.

5.2.17.2 Grade 0: without time delay

Table 20 — Release test without time delay

Test procedure	Acceptance criteria
Start position: The door is closed.	
Energize the exit system at the rated voltage plus 15 %	electric locking element or electrically lockable operating element is electrically locked
Operate the initiating element	electric locking element or electrically lockable operating element is electrically released

5.2.17.3 Grade 1: after a single time delay

Table 21 — Release test after a single time delay

Test procedure	Acceptance criteria
Start position: The door is closed.	
Energize the exit system at the rated voltage plus 15 %	electric locking element or electrically lockable operating element is electrically locked
Operate the initiating element	Time delay t1 starts Visual and acoustic Signal as Down counter see 4.2.11.7. Electric locking element or electrically lockable operating element is electrically released after t1.

5.2.17.4 Grade 2: after a double time delay (t1+t2)

Table 22 — Test for starting conditions of time delay t2

Test procedure	Acceptance criteria
Start position: The door is closed	
Energize the exit system at the nominal voltage plus 15 %	electric locking element or electrically lockable operating element is electrically locked
Activate the time delay t2 from the CMC	Time delay t2 doesn’t start (An activation of t2 is only permitted during t1)
Operate the initiating element	Time delay t1 starts Visual and acoustic Signal as Down counter see 4.2.11.7. Electric locking element or electrically lockable operating element is electrically released after t1
Reset the exit system	The system changes immediately to the electrically locked status

Table 23 —Release test after a double time delay

Test procedure	Acceptance criteria
Operate the initiating element	Time delay t1 starts Visual and acoustic Signal as Down counter see 4.2.11.7
Activate the time delay t2 from the CMC during t1	Time delay t2 starts and replaces t1. Visual and acoustic Signal as Down counter see 4.2.11.7 Electric locking element or electrically lockable operating element is electrically released after t2
Try to restart t2 from the CMC	A restart is not permitted
Reset the exit system	The system changes immediately to the electrically locked status
Operate the initiating element	Time delay t1 starts Visual and acoustic Signal as Down counter see 4.2.11.7
Activate the time delay t2 from the CMC during t1	Time delay t2 starts and replaces t1. Visual and acoustic Signal as Down counter see 4.2.11.7
During t2 try to restart t2 from the CMC	A restart is not permitted
End of t2	Electric locking element or electrically lockable operating element is electrically released after t2

5.2.18 Central Management Control Tests

5.2.18.1 Central Management Control – Functions verifications

According the requirements of 4.2.18.1, the verification will be based on visual inspection of the CMC panel.

5.2.18.2 Central Management Control – Tests

5.2.18.2.1 CMC Safety functions

According the requirements of 4.2.18.2.1 the tests are based on the design of the exit system and claim functions and installation abilities from the manufacturer, according to the risk analysis and criteria of failure on safety functions the notified body will verify:

1) Operating tests: the safety functions are checked by visual inspection, manufacturer declaration, design proof evidences and measurements according to the standard requirements;

2) Compatibility tests: according to the system configurations listed by the manufacturer, it is the responsibility of the notified body to identify and test the worst combination cases to be tested to cover full various systems. Verification consists in measurements and operating sequences in order to check the compatibility parameters.

Table 24 — Test of the safety connection and power failure of CMC

Test procedure	Acceptance criteria
Start position: put the system into electrically locked status, the CMC is connected and working according to manufacturer's instructions.	
No time delay at the depending door	
Put the line on earth	The depending door(s) remains in the electrically locked status if the ability of release from the door initiating element is ensured.
Set the connection in proper condition	
Make a short circuit on the line	The depending door(s) remains in the electrically locked status if the ability of release from the door initiating element is ensured.
Set the connection in proper condition	
Disconnect the line or cut a wire	The depending door(s) remains in the electrically locked status if the ability of release from the door initiating element is ensured.
Set the connection in proper condition	
Power failure of CMC	The depending door(s) remains in the electrically locked status if the ability of release from the door initiating element is ensured.
Power on	
During time delay t1 at the depending door	
Put the line on earth	After t1, releases each of the depending door(s).
Set the connection in proper condition	
Reset and relock the door	
Make a short circuit on the line	After t1, releases each of the depending door(s).
Set the connection in proper condition	
Reset and relock the door	
Disconnect the line or cut a wire	After t1, releases each of the depending door(s).
Set the connection in proper condition	
Reset and relock the door	
Power failure of CMC	After t1, releases each of the depended door(s).
Power on	
During time delay t2 at the depending door	
Put the line on earth	If this has an influence of the ability to release from the general safety release CMC push button, the door has to change immediately to the electrically unlocked status. If not then the door has to change after t2 to the electrically unlocked status. A door can switch from CMC mode to door mode and react on local conditions, without the possibility of activating t2.
Set the connection in proper condition	

Make a short circuit on the line	If this has an influence of the ability to release from the general safety release push button, the door has to change immediately to the electrically unlocked status. If not then the door has to change after t2 to the electrically unlocked status. A door can switch from CMC mode to door mode and react on local conditions without the possibility of activating t2.
Set the connection in proper condition	
Disconnect the line or cut a wire	If this has an influence of the ability to release from the general safety release CMC push button, the door has to change immediately to the electrically unlocked status. If not then the door has to change after t2 to the electrically unlocked status. A door can switch from CMC mode to door mode and react on local conditions without the possibility of activating t2.
Set the connection in proper condition	
Power failure of CMC	If this has an influence of the ability to release from the general safety release CMC push button, the door has to change immediately to the electrically unlocked status. If not then the door has to change after t2 to the electrically unlocked status. A door can switch from CMC mode to door mode and react on local conditions without the possibility of activating t2.
Power on	
Denied exit mode, if the exit system has the ability	
Put the line on earth	If there is no influence to switch off the denied exit mode then the system can stay in this mode otherwise the denied exit mode switched off.
Set the connection in proper condition	After 60 s of correct connection the denied exit mode can be switched on.
Make a short circuit on the line	Denied exit mode is switched off.
Set the connection in proper condition	After 60 s of correct connection the denied exit mode can be switched on.
Disconnect the line or cut a wire	Denied exit mode switched off.
Set the connection in proper condition	After 60 s of correct connection the denied exit mode can switched on.
Power failure of CMC	Denied exit mode switched off.
Power on	After 60 s of power on and correct connection the denied exit mode can switched on.

5.2.18.2.2 CMC Remote functions

According the requirements the tests methods are: Visual inspection and operation of the double time delay function. Create a failure (breakage, short-circuit, earthing) during the process of t1 and after t2, to check if the time delay ended at time set or immediately. The remote functions shall not interfere or overrule with the safety functions of the CMC and/or the door exit systems it is checked by a risk analysis.

5.2.18.2.3 General safety release push button

The general safety release push button has to fulfil the design requirements of 4.2.18.2.3. The test method is a visual inspection and a risk analysis.

Table 25 — Function of the general safety release push button test

Test procedure	Acceptance criteria
Start position: put the system into electrically locked status, the CMC is connected and working according to manufacturer's instructions.	
No time delay, start position	
Actuate the general safety release push button	The system at the depending door(s) changes immediately to the electrically unlocked status. A visual and audible signal started.
Try to reset the system without authorization	No reset.
Try to reset the system with authorization before 60 s	No reset.
Reset the system with authorization after 60 s	The general safety release is reset.
During time delay t1 at the depending door	
Actuate the general safety release push button	The system at the depending door(s) changes immediately to the electrically unlocked status. A visual and audible signal started.
Try to reset the system without authorization	No reset.
Try to reset the system with authorization before 60 s	No reset.
Reset the system with authorization after 60 s	The general safety release is reset.
During time delay t2 at the depending door	
Actuate the general safety release push button	The system at the depending door(s) changes immediately to the electrically unlocked status. A visual and audible signal started.
Try to reset the system without authorization	No reset.
Try to reset the system with authorization before 60 s	No reset.
Reset the system with authorization after 60 s	The general safety release is reset.
Denied exit mode if the exit system has the ability	
Actuate the general safety release push button	The system at the depending door(s) changes immediately to the electrically unlocked status. A visual and audible signal started.
Try to reset the system without authorization	No reset.
Try to reset the system with authorization before 60 s	No reset.
Reset the system with authorization after 60 s	The general safety release is reset.

5.2.18.2.4 Denied exit mode

The test method is according the requirements of 4.2.18.2.4 for activating, deactivating and signallisation of the denied exit mode.

Table 26 — Requirements for activation and deactivation the denied exit mode

Test procedure	Acceptance criteria
Start position: put the system into electrically locked status, the CMC is connected and working according to manufacturer's instructions.	
Denied exit mode is not permitted	
Initiating element on one or many doors are activated	No change to denied exit mode.
Resetting on one or many doors are required	No change to denied exit mode.
One or many doors are unlocked	No change to denied exit mode.
Signal from a alarm system on one or many doors	No change to denied exit mode.
Try to start denied exit mode without authorization	No change to denied exit mode.
Switch to denied exit mode	
Start denied exit mode with authorization and without any contrary conditions	Change to denied exit mode on.
Switch the denied exit mode off	
Deactivation without authorization	Change the denied exit mode off.
Start denied exit mode with authorization and without any contrary conditions	Change to denied exit mode on.
Signal from a alarm system on one or many doors	Change the denied exit mode off. Note: For security reason it affects only depending doors.
Reset alarm system	
Start denied exit mode with authorization and without any contrary conditions	Change to denied exit mode on.

The denied exit mode may be activated from one or several central points (security guard with one or several CMCs), for the entire building or part of it.

This has an impact on the activating or deactivating of the denied exit mode:

If there are more than one CMC with different groups of doors, the activation of the denied exit mode is depending on the related group of the CMC. If there are doors, which are in both groups, the denied exit mode can be activated from one or both CMC. If this door activated from both CMC it has to be deactivated also from both. If there is a signal from an alarm system independent of the number of CMC activating the door has to release. This is tested according the Table 26 and by risk analysis.

5.2.18.2.5 Double time delay

According to the requirements of 4.2.18.2.5, the exit system shall be tested using the following steps:

Table 27 — Requirements for activation and deactivation t2

Test procedure	Acceptance criteria
Start position: put the system into electrically locked status, the CMC is connected and working according to manufacturer's instructions.	
Start t2 denied	
Unauthorised start of t2	Unable.
Authorized start of t2 **not** during the time frame of t1 of the door	Unable.
Start t2	
Authorized start of t2 during the time frame of t1	For selected doors during the time frame of t1 the double time delay t2 start. The CMC show the status according to the requirements.
After t2 ended (depending on the door start and time set).	Electric locking element or electrically lockable operating element is electrically released after t2
Try to restart t2 on doors after running out of t2	Unable.
End t1 and t2	
Activate t1 of one or many doors	
After t1 ended (depending on the door start and time set).	Electric locking element or electrically lockable operating element is electrically released after t1. No extension of the time delay t1 or t2.
Reset and relock the system	Electric locking element or electrically lockable operating element is electrically relocked
Activate t1 of one or many doors	
Activate t2 during t1 of one or many doors	For selected doors during the time frame of t1 the double time delay t2 starts. The CMC show the status according the requirements.
After t2 ended (depending on the door start and time set).	Electric locking element or electrically lockable operating element is electrically released after t2
End time delay button	
Activate t1 of one or many doors	
Activate the end time delay button	The system at the depending door(s) changes immediately to the electrically unlocked status.
Reset and relock the system	Electric locking element or electrically lockable operating element is electrically relocked
Activate t1 of one or many doors	
Activate t2 during t1 of one or many doors	For selected doors during the time frame of t1 the double time delay t2 start. The CMC show the status according the requirements.
Activate the end time delay button	The system at the depending door(s) changes immediately to the electrically unlocked status.

5.2.18.2.6 Monitoring status

In order to verify the monitoring status requirements of 4.2.18.2.6, is done by visual inspection and/or functional tests.

5.2.18.2.7 Optional interface

Contains a CMC an interface to other linked systems is to verify that the requirements of 4.2.18.2.7 are fulfilled by risk analysis, design poof, visual inspection and/or functional tests.

5.2.18.2.8 Human interface

In order to verify the requirements of 4.2.18.2.8, dimensions or designs shall be checked with adequate tools, visual inspection and/or functional tests.

5.2.19 Outside Access Device

The test will be performed according to EN 1125 or EN 179 depending on the operating element.

5.2.20 Security tests (Sample A)

5.2.20.1 Security tests for security from outside

According to the requirements of 4.2.20.1, the test shall be performed with the below sequences.

In the case of electrical locking intended for double swing doors, these shall be tested in both exit directions.

In the case of double doorset, conduct above test on each leaf consecutively, in accordance with the closing sequence of the system under test.

In the case of system includes several electrical locking elements, conduct above test for each separate locking element.

Table 28 — Security tests from outside of electrical locking element

Test procedure	Acceptance criteria
Start position: The door is closed	
Energize the exit system to the nominal voltage	The door is electrically locked
Apply a force given in 4.2.20.1 in the direction of opening. The force shall be applied within 100mm of the electric locking point with a rate of 50 N/s ± 10 % The force shall be held for 10 s.	The door is still electrically locked
Remove the force at the same rate of the loading	
Switch off the electric power of the electric locking element	The electric locking element is unlocked after maximum 1 s. This can be measured with an oscilloscope. The unlock status shall be verified by a manual door opening.

According to the requirements of 4.2.20.1, the test shall be performed with the below sequences.

In the case of exit device intended for double swing doors, these shall be tested in both exit directions.

In the case of double doorset, conduct above test on each leaf consecutively, in accordance with the closing sequence of the system under test.

In the case of multipoint locking exit device, conduct above test and apply the force near to the main locking point.

Table 29 — Security tests from outside of the mechanical exit device from the exit system

Test procedure	Acceptance criteria
Start position: The door is closed	
The exist system shall not be energised	The door is not electrically locked
Apply a force given in 4.2.20.1 in the direction of opening. The force shall be applied within 100mm of the main mechanical locking point (when multipoint solution) with a rate of 50 N/s ± 10 % The force shall be held for 10 s.	The door is still mechanically locked
Remove the force at the same rate of the loading	
Open the test door	Not restrict or impede the free movement of the door

According to the requirements of 4.2.20.1, the test shall be performed with the below sequences.

In the case of electrically lockable operating elements intended for double swing doors, these shall be tested in both exit directions.

In the case of double doorset, conduct above test on each leaf consecutively, in accordance with the closing sequence of the system under test.

In the case of electrically lockable operating elements is designed with multipoint locking, conduct above test and apply the force near to the main locking point.

Table 30 — Security tests from outside of the electrically lockable operating elements

Test procedure	Acceptance criteria
Start position: The door is closed	
Energize the exit system to the nominal voltage	The electrically lockable operating element is locked
Apply a force given in 4.2.20.1 in the direction of opening. The force shall be applied within 100mm of the main locking point (when several) with a rate of 50 N/s ± 10 % The force shall be held for 10 s.	The door is still locked
Remove the force at the same rate of the loading	
Switch off the electric power of the electric locking element	The electric locking element is unlocked after maximum 1 s. This can be measured with an oscilloscope. The unlock status shall be verified by a manual door opening.
Open the test door	Not restrict or impede the free movement of the door

5.2.20.2 Security tests for security from inside

5.2.20.2.1 Security tests of electrical locking element

For the inside security aspect it is issued from tests results made for outside.

5.2.20.2.2 Security tests from inside of the mechanical exit device from the exit system

No test is conducted for security from inside with the mechanical exit device since this element is free to be operated and maintain in the released position.

5.2.20.2.3 Security tests from inside of electrical lockable operating element

According to the requirements of 4.2.20.2, the test shall be performed with the following sequence:

In the case of electrical lockable operating element intended for double swing doors, these shall be tested in both exit directions.

In the case of double doorset, conduct above test on each leaf consecutively, in accordance with the closing sequence of the system under test.

In the case of electrically lockable operating elements designed with multipoint locking, conduct above test and apply the force near to the main locking point.

Where applicable, apply the relevant force of 4.2.20.2 with the electrically lockable operating element in its locked state, as follows:

a) Lever handle operation: To the lever handle in the direction to enable release and at 25 mm from the free end of the lever handle;

b) Push pad operation: To a push pad in the direction to enable release and within 25 mm from the free end of the push pad;

c) Bar operation: To a bar in the direction to enable release at three positions along the bar, midpoint and within a maximum of 25 + 10mm/-0 mm from each bar end.

Table 31 — Security tests of lockable operating element

Test procedure	Acceptance criteria
Start position: The door is closed.	
Energize the exit system at the nominal voltage ± 2 %	The door is electrically locked
Apply a force of 4.2.20.2 like described with a rate of 50 N/s ± 10 % The force shall be held for 10 s.	The door is still electrically locked
Unload the force with the same rate of the loading	

5.3 Tests for self-closing ability C (Sample A)

According to the requirements of 4.3, the test shall be performed with the sequence defined in Table 32. It consists of a Reengagement test of the electrical locking element.

Table 32 — Reengagement tests of electrical locking element

Test procedure	Acceptance criteria
Start position: The locking element and the keeper shall be cleaned before each test. The distance between the locking element and the keeper shall be set at the minimum required by the manufacturer's instruction. The door shall be opened so that the locking element is in contact with the keeper. The system shall not be energized.	
Apply a force given in 4.3 in the direction of closing. The force shall be applied within 100mm of the electric locking point with a rate of 10 N/s ± 10 %	The door shall reach the closed position.
Activate the electrical locking element under the load. After max. 3 s, the load shall be removed	The door shall be locked.

This test shall be conducted three times. The three results shall be recorded.

5.4 Tests for Suitability for use on fire and smoke doors (Samples D and E)

The test methods are described in EN 1634-1 or EN 1634-2 and EN 1634-3.

5.5 Control of Dangerous substances

See 4.5.

5.6 Tests for the Durability of ability to release and ability to self-closing (Sample A)

5.6.1 General

According to the requirements of 4.6 and 4.7, the electrical locking/release function and the initiating element shall be operated for a total number of cycles according to its grade shown in Table 3. A cycle consists of the following:

a) energize the exit system at the rated voltage plus 15 %;

b) to simulate any influence of seals or gaskets, apply a force of 25 N to the door leaf at a position of 550 mm from the centre line of the hinges of the test door leaf and between 800 mm and 1 200 mm from the bottom of the test door in the direction of exit;

c) actuate the initiating element;

d) actuate the operating element, when applicable;

e) open the door to an angle of between 10° and 12° by solely actuating the operating element;

f) following a dwell period of not less than 0,5 s a closing force shall be applied to return the test door to the secured position in a time of between 1,0 s and 2,0 s. The closing force shall be removed when the test door reaches the 5° ± 1° open position, allowing the test door to latch by kinetic energy alone, and with no residual closing moment;

g) following a dwell period in the latched position of not less than 0,5 s cycling shall continue for the required number of cycles.

When an outside access device is supplied with optional re-entry function, then this function shall be tested 20 cycles every testing day or after not more than 20 000 cycles.

The maximum number of locking elements specified by the manufacturer shall be connected for this test. The exit system shall be supplied with rated supply voltage at $^{+15}_{0}$ %.

When the function of the locking element may be influenced when used in a double door situation, the test shall be performed on a double leaf test door.

When the initiating element is not part of the operating element, then it shall be operated according to Table 3 for the first part of the durability test. The remaining cycles may be completed by simulating operation of the initiating element.

Any incorporated time delay function shall be disabled for the purposes of this test.

After the test, verify that the exit system meets the release requirements of 4.2. If the exit system includes a time delay function, repeat the time delay release test of 5.2.9. If an initiating element incorporates a breakable cover to operate, this shall be tested three times prior to the durability test, then further cycling may be completed without the cover.

Where periodic lubrication is required during and after installation, according to the manufacturer fitting instructions, it shall be possible to lubricate without dismantling the exit device (Removing the covers is accepted).

Lubrication shall be possible at no less interval than 20 000 cycles (or more, according to the manufacturer fitting instructions).

5.6.2 Abuse resistance test of electrical locking element

According to the requirement in 4.6.2, the following test shall be conducted:

This test shall only be required if the electric locking element is accessible in the closed position of the test door. The force shall be applied using a rubber (shore 45 A) actuator of 20mm diameter with a thickness 18.5mm.

Table 33 — Abuse resistance test of electrical locking element

Test procedure	Acceptance criteria
Start position: Door closed, clamped and locked.	
Apply the static force of 4.6.2 to the electrical locking element at three different positions in a direction likely to cause damage to the electrical locking element.	No structural damage or crack with influence of the ability to release, necessary electrical insulation or rip of the element. Note: A damage of a decorative cover with no influence of the electric locking element is acceptable.
Unload the static force and release the locking element	Immediately release of the electrical locking element.
Open the test door	Not restrict or impede the free movement of the door.

Due to the various designs of electrical locking elements, the positions and directions shall be agreed with the manufacturer and the test laboratory prior to testing and the location and direction shall be recorded in the final test report.

If the design of the electrical locking element does not permit the force to be applied, then these tests maybe omitted.

5.6.3 Abuse resistance test of initiating element

According to the requirement in 4.6.3, the following test shall be conducted:

The force shall be applied using a rubber (shore 45 A) actuator of 20mm diameter with a thickness 18.5mm.

This test shall be conducted three times. Verify each time that the exit system meets the requirements of 4.2.

Table 34 — Abuse resistance test of initiating element

Test procedure	Acceptance criteria
Start position: Door closed, clamped and locked.	
Apply the static force of 4.6.3 to the initiating element at any of a maximum of three different positions and in a horizontal direction likely to cause damage.	No structural damage or crack with influence of the ability to release, necessary electrical insulation or rip of the element. Note: A damage of a decorative cover with no influence of the electric locking element is acceptable.
Actuate the initiating element	Immediately release of the electrical locking element.

If the design of the electrical locking element does not permit the force to be applied, then these tests maybe omitted.

This requirement is only applicable to a separate initiating element, independent of an operating element.

5.6.4 Abuse resistance of electrically lockable operating element

Where applicable, apply the relevant force of 4.2.20.2 with the electrically lockable operating element in its locked state, as follows:

a) Lever handle operation: To the lever handle in the direction to enable release and at 25 mm from the free end of the lever handle;

b) Push pad operation: To a push pad in the direction to enable release and within 25 mm from the furthest point away from the axis or the bearing point of the push pad;

c) Bar operation: To a bar in the direction to enable release at three positions along the bar, midpoint and within a maximum of 25 mm from each bar end.

Table 35 — Abuse resistance of electrically lockable operating element

Test procedure	Acceptance criteria
Start position: Door closed and locked.	
Apply the static force like described to the operating element for 10 s.	No structural damage or crack with influence of the ability to release, necessary electrical insulation or rip of the element. Note: A damage of a decorative cover with no influence of the electric locking element is acceptable.
Actuate the initiating element. After the static load.	Immediately release of the electrical lockable operating element.
Open the test door	Not restrict or impede the free movement of the door.

This test shall be conducted three times. Verify each time that the exit system meets the requirements of 4.2.

5.6.5 Temperature test (Sample B)

5.6.5.1 Principle

According to the requirements of 4.6.5, the electrically controlled exit system shall be exposed in as assembled a state as possible to high and low temperatures for sufficient time to allow temperature stability to be reached, and for functional tests to be conducted.

The test is conducted according to 5.6.5.2 the electrically controlled exit system shall be energised during conditioning.

Due to the size of the small test door 2 used, the maximum release force values described in the 4.2.7, these can be increased within a maximum of +25 %, in all temperature variations: −10°C, +20°C and +55°C.

NOTE The humidity level is not critical during this test.

5.6.5.2 Test procedure

a) Energize the system at nominal voltage +15 %.

b) Stabilize the electrically controlled exit system for a minimum of 4 h at a temperature of +20 C.

c) While still in the test chamber, measure and record operating forces of 5.2.7.

d) Stabilize the electrically controlled exit system for a minimum of 4 h at a temperature of +55°C.

e) While still in the test chamber, measure and record operating forces of 5.2.7.

f) Stabilize the electrically controlled exit system for a minimum of 4 h at a temperature of −10 °C.

g) While still in the test chamber, measure and record operating forces of 5.2.7.

Alternatively, where it is not possible to make the measurement inside the test chamber, it is possible to make it outside in a maximum time of 5 min.

5.6.6 Corrosion test (Sample B)

5.6.6.1 Principle

According to the requirements of 4.6.6, the test consists of exposing the initiating element, the controlling element, the locking element, and/or any operating element which is electrically lockable to a neutral salt spray test according to EN 1670. The system shall operate before and after the test. This applies to all elements whether or not fixed to the frame, the door, inside or outside.

Parts that have already been tested and achieved grade 3 for corrosion resistance under EN 1125 or EN 179 need not be retested.

NOTE This test is aimed at verifying the performance, not the appearance of the product after exposure to the corrosion Test.

5.6.6.2 Installation

Place the elements of the exit system in the salt spray chamber in as assembled a state as possible. The elements shall not be energized during the conditioning.

5.6.6.3 Test procedure

The test shall be carried out in the order detailed below.

5.6.6.4 Initial measurements

Before the conditioning, subject the exit system to the release test of 5.2.7.

5.6.6.5 Conditioning

With the system not energized, subject the elements of the exit system to a neutral salt spray test in accordance with EN 1670.

5.6.6.6 Final measurements

After completion of the test remove the elements of the exit system from the cabinet and rinse them gently in clean running water at a temperature not exceeding 40° C. Immediately following the neutral salt spray test, and cleaning, re-install the exit system on the test door.

Subject the exit system to the release test of 5.2.7 three times with measurement of operating forces, and verify each time that the operating force does not exceed 150 % of those stated in 4.2.7. It is acceptable that the locking element does not lock the door since the objective is to release the door. This information shall be part of the test report and shall be part of the product information.

5.6.7 Dry heat test (Sample B)

5.6.7.1 Principle

According to the requirements of 4.6.7 the test consists of exposing the initiating element, the controlling element, the locking element, and/or any operating element which is electrically lockable to the high temperature for sufficient time to allow temperature stability to be reached, and for functional tests to be conducted. “Free air” conditions are simulated for heat-dissipating specimens to allow for self-heating effects.

NOTE An element is considered heat dissipating only if the hottest point on its surface measured in free air condition (i.e. with no forced air circulation) is more than 5 °C above the ambient temperature of the surrounding atmosphere after temperature stability has been reached.

5.6.7.2 Installation

The exit system, inclusive of all its components and including the operating element if it is electrically lockable, shall be installed in the test chamber using test door 2 in accordance with the manufacturer’s instructions.

5.6.7.3 Test procedure

The test apparatus and procedure shall be as described in EN 60068-2-2 according to requirements in 4.6.7.

5.6.7.4 Conditioning

With the exit system energised, apply a conditioning temperature of 55 °C ± 2 °C for a duration of 16 h.

5.6.7.5 Measurements during conditioning

Monitor the exit system during the conditioning period to detect any change in status. During the last half hour of the conditioning period, subject the exit system to the release test of 5.2.3 and 5.2.6.

5.6.8 Cold test (Sample B)

5.6.8.1 Principle

According to the requirements of 4.6.8, the test consists of exposing the initiating element, the controlling element, the locking element, and/or any operating element which is electrically lockable to the low temperature for sufficient time to allow temperature stability to be reached, and for functional tests to be conducted. “Free air” conditions are simulated for heat-dissipating specimens to allow for self-heating effects.

5.6.8.2 Installation

The exit system inclusive of all its components, including the operating element if it is electrically lockable, shall be installed in the test chamber using test door 2 in accordance with the manufacturer’s instructions.

5.6.8.3 Test procedure

The test apparatus and procedure shall be as described in EN 60068-2-1 according to 4.6.8.

5.6.8.4 Conditioning

Apply a conditioning temperature of −10 °C ± 3 °C for a duration of 16 h.

5.6.8.5 Measurements during conditioning

Monitor the exit system during the conditioning period to detect any change in status. During the last half hour of the conditioning period, subject the exit system to the release test of 5.2.3 and 5.2.6.

5.6.9 Damp heat cyclic test (12h + 12h) (Sample B)

5.6.9.1 Principle

According to the requirements of 4.6.9, the test consists of exposing the initiating element, the controlling element, the locking element, and/or any operating element which is electrically lockable to several temperature cycles, in which the relative humidity is maintained at a high level, for sufficient time to allow temperature stability to be reached, and for functional tests to be conducted. “Free air” conditions are simulated for heat-dissipating specimens to allow for self-heating effects.

5.6.9.2 Installation

The exit system inclusive of all its components, including the operating element if it is electrically lockable, shall be installed in the test chamber using test door 2 in accordance with the manufacturer’s instructions, when energized at nominal voltage +15 %.

5.6.9.3 Test procedure

The test apparatus and procedure shall be as described in EN 60068-2-30 according to 4.6.9.

The test cycle Db Variant 2 shall be used with the upper temperature and the number of cycles specified in 5.6.9.4.

5.6.9.4 Conditioning

With the exit system energized, submit the system to 2 cycles with a upper temperature of 55 °C.

5.6.9.5 Measurements during conditioning

Monitor the exit system during the conditioning period to detect any change in status. During the last half hour of the conditioning period, subject the exit system to the release test of 5.2.3 and 5.2.6.

5.6.10 Impact test (Sample B)

5.6.10.1 Principle

According to the requirements of 4.6.10, the test consists of exposing the initiating element and controlling element of the exit system to impact from a small hammer head on any exposed surface.

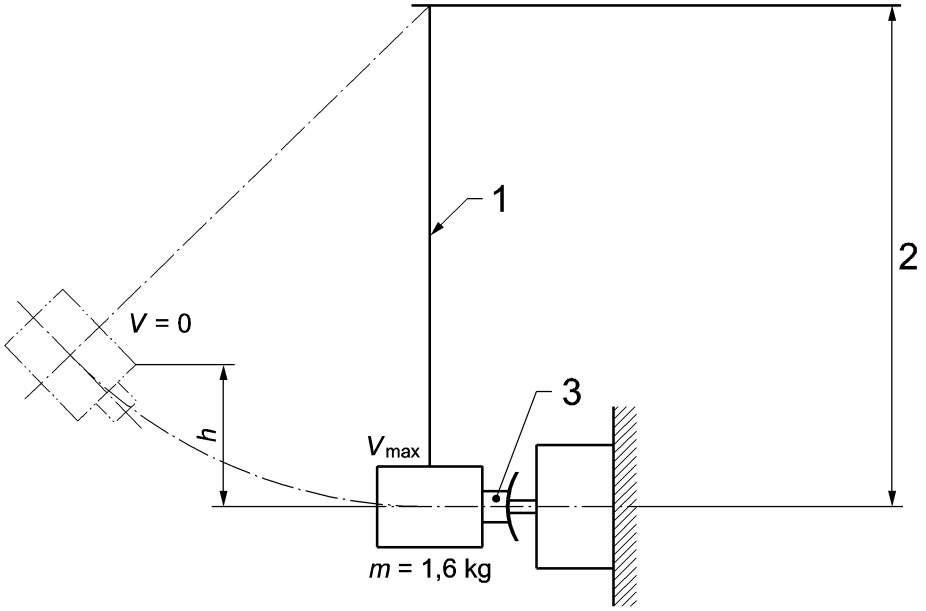
The force shall be applied using a rubber (shore 45 A) actuator of 20mm diameter with a thickness 18,5 mm.

The electrically controlled exit system has to be reset prior to each strike.

The hammer shall be released while stationary.

To ensure that the hammer is released while stationary, a magnetic or other holding mechanism should be used.

This test shall be performed three times.



Key

1 recommended material: aluminium tube, diameter 20 mm, thickness 1 mm

2 recommended length: 1 500 mm

3 rubber 45 shore A; diameter 20 mm; thickness 18,5 mm

NOTE The 1,6 kg mass does not include the mass of the aluminium tube.

Figure 5 —Hammer test (based on EN 60947-5-5)

5.6.10.2 Abuse resistance of the operating surface of the initiating element

Table 36 — Abuse resistance of the operating surface of the initiating element

Test procedure	Acceptance criteria
Start position: Door closed and locked.	
Striking the actuator of the initiating element with the hammer shown in Figure 5, where h = requirement of 4.6.10.	Electrical locking element or electrically lockable operating element releasing No structural damage or crack with influence of the ability to release, necessary electrical insulation or rip of the element. Note: A damage of a decorative cover with no influence of the electric locking element is acceptable.
Remove the hammer	
Return the initiating element to start position if necessary	The initiating element is not in the start position
Reset the exit system	The system changes immediately to the electrically locked status

This test shall be conducted three times.

5.6.10.3 Abuse resistance against shock

Table 37 — Abuse resistance against shock

Test procedure	Acceptance criteria
Start position: Door closed and locked. t1: time delay period t1 is running or t2: time delay period t2 is running or denied exit mode: is active	
Striking the actuator of the described element with the hammer shown in Figure 5, where h = requirement of 4.6.10.	Electrical locking element or electrically lockable operating element not releasing. No structural damage or crack with influence of the ability to release, necessary electrical insulation or rip of the element. Note: A damage of a decorative cover with no influence of the electric locking element is acceptable.
- Time delay t1	Electric locking element or electrically lockable operating element is electrically released within 15s.
- Time delay t2	Electric locking element or electrically lockable operating element is electrically released within 180s.
- Denied exit mode: deactivate	Immediately release of the electrical locking element or electrically lockable operating element.
Open the test door	Not restrict or impede the free movement of the door.
Close the test door	Not restrict or impede the free movement of the door.
Remove the hammer	
Return the initiating element to start position if necessary	The initiating element is in the start position
Reset the exit system	The system changes immediately to the electrically locked status

This test shall be conducted three times.

5.6.11 Supply voltage variations test (Sample B)

5.6.11.1 Principle

According to the requirements of 4.6.11, the test consists of exposing the exit system to each of the maximum and minimum power supply conditions for a sufficient time to obtain temperature stability and performing functional tests under these conditions.

5.6.11.2 Installation

The exit system inclusive of all its component, shall be installed using test door 1 or 2 in accordance with the manufacturer's instructions.

5.6.11.3 Test procedure

NOTE No reference can be made to an internationally accepted standard at present.

The exit system shall be subjected to each of the specified power supply conditions until temperature stability is reached and a functional test has been conducted.

5.6.11.4 Initial measurements

The voltage specifications of each electric component shall be in accordance with 4.6.11.

5.6.11.5 Conditioning

According to values of Table 9, apply the severity of conditioning for the indicated type of supply.

5.6.11.6 Measurements during conditioning

Monitor the exit system during the conditioning period to detect any change in status. At the end of each of the conditioning periods after temperature stability has been achieved, subject the exit system to the release test of 5.2.7.

5.6.11.7 Final measurements

After the conditioning at both of the specified power supply conditions, inspect the exit system visually for mechanical damage both externally and internally.

5.6.12 Electrical hazards safety tests (Sample B)

According to the requirements of 4.6.12, the test consists of carrying out on the electrical elements of the exit system having a supply voltage ranging from 50 V AC to 1 000 V AC and 75 V DC to 1 500 V DC the relevant inspections and individual tests listed in EN 60950-1.

5.6.13 Electromagnetic compatibility (EMC) tests (Sample B)

According to the requirements of 4.6.13, tests from the EMC standards shall be conducted using the minimum configuration as defined by the manufacturer, i.e. only electronic and electromechanical components that fall in the scope of EMC.

During the EMC test, verify the following:

— Emission tests: verify that the exit system does not exceed the emission levels defined in the standards.

— Immunity tests: verify that the exit function is not affected. In a locked position a release of the door shall always be possible.

Verify that there shall be no permanent damage on any element of the exit system. In a locked position a release of the door shall always be possible.

5.6.14 (IP)Protection against solid foreign objects and ingress of water and dust test (Sample B)

According to the requirements of 4.6.14, the compliance is checked by the test methods of the following standard:

— EN 60529:1991, *Degrees of protection provided by enclosures (IP code);*

After the test, verify that the exit system shall be able to release immediately after the test, without a need to dry.

5.7 Tests for the Durability of ability to self-closing (Sample A)

The tests are the same as 5.6 and have not to be repeated.

6 Assessment and verification of constancy of performance - AVCP

6.1 General

The compliance of electrically controlled exit systems for use on escape routes with the requirements of this standard and with the performances declared by the manufacturer in the DoP shall be demonstrated by:

— determination of the product type

— factory production control by the manufacturer, including product assessment.

The manufacturer shall always retain the overall control and shall have the necessary means to take responsibility for the conformity of the product with its declared performance(s).

6.2 Type testing

6.2.1 General

All performances related to characteristics included in this standard shall be determined when the manufacturer intends to declare the respective performances unless the standard gives provisions for declaring them without performing tests. (e.g. use of previously existing data, CWFT and conventionally accepted performance).

Assessment previously performed in accordance with the provisions of this standard, may be taken into account provided that they were made to the same or a more rigorous test method, under the same AVCP system on the same product or products of similar design, construction and functionality, such that the results are applicable to the product in question.

NOTE 1 Same AVCP system means testing by an independent third, under the responsibility of a notified product certification body.

— For the purposes of assessment, the manufacturer's products may be grouped into families, where it is considered that the results for one or more characteristics from any one product within the family are representative for that same characteristics for all products within that same family

NOTE 2 Products may be grouped in different families for different characteristics.

Reference to the assessment method standards should be made to allow the selection of a suitable representative sample.

In addition, the determination of the product type shall be performed for all characteristics included in the standard for which the manufacturer declares the performance:

— at the beginning of the production of a new or modified Electrically controlled exit systems for use on escape routes (unless a member of the same product range), or

— at the beginning of a new or modified method of production (where this may affect the stated properties); or

They shall be repeated for the appropriate characteristic(s), whenever a change occurs in the Electrically controlled exit systems for use on escape routes design, in the raw material or in the supplier of the components, or in the method of production (subject to the definition of a family), which would affect significantly one or more of the characteristics.

Where components are used whose characteristics have already been determined, by the component manufacturer, on the basis of assessment methods of other product standards, these characteristics need not be re-assessed. The specifications of these components shall be documented.

Products bearing regulatory marking in accordance with appropriate harmonized European specifications may be presumed to have the performances declared in the DoP, although this does not replace the responsibility on the Electrically controlled exit systems for use on escape routes manufacturer to ensure that the Electrically controlled exit systems for use on escape routes as a whole is correctly manufactured and its component products have the declared performance values.

6.2.2 Test samples, testing and compliance criteria

The number of samples of electrically controlled exit systems for use on escape routes to be tested/assessed shall be in accordance with Table 38.

Table 38 — Number of samples to be tested and compliance criteria

Characteristic	Requirement	Assessment method	No. of samples	Compliance criteria
Ability to release	4.2	5.2	1 (Sample A)	4.2
Self closing ability C	4.3	5.3	same used for ability to release	4.3
Suitability for use on fire/smoke doors	4.4	5.3	2 (Sample D& E)	4.4
Durability of ability to release	4.6	5.6	1 (Sample B)	4.6
Durability for self closing ability C	4.7	5.7	same used for durability of ability to release	4.7

6.2.3 Test reports

The results of the determination of the product type shall be documented in test reports. All test reports shall be retained by the manufacturer for at least 10 years after the last date of production of the Electrically controlled exit systems for use on escape routes to which they relate.

6.3 Factory production control (FPC)

6.3.1 General

The manufacturer shall establish, document and maintain an FPC system to ensure that the products placed on the market comply with the declared performance of the essential characteristics.

The FPC system shall consist of procedures, regular inspections and tests and/or assessments and the use of the results to control raw and other incoming materials or components, equipment, the production process and the product.

All the elements, requirements and provisions adopted by the manufacturer shall be documented in a systematic manner in the form of written policies and procedures.

This factory production control system documentation shall ensure a common understanding of the evaluation of the constancy of performance and enable the achievement of the required product performances and the effective operation of the production control system to be checked. Factory production control therefore brings together operational techniques and all measures allowing maintenance and control of the compliance of the product with the declared performances of the essential characteristics.

6.3.2 Requirements

6.3.2.1 General

The manufacturer is responsible for organizing the effective implementation of the FPC system in line with the content of this product standard. Tasks and responsibilities in the production control organization shall be documented and this documentation shall be kept up-to-date.

The responsibility, authority and the relationship between personnel that manages, performs or verifies work affecting product constancy, shall be defined. This applies in particular to personnel that need to initiate actions preventing product non-constancies from occurring, actions in case of non-constancies and to identify and register product constancy problems.

Personnel performing work affecting the constancy of performance of the product shall be competent on the basis of appropriate education, training, skills and experience for which records shall be maintained.

In each factory the manufacturer may delegate the action to a person having the necessary authority to:

— identify procedures to demonstrate constancy of performance of the product at appropriate stages;

— identify and record any instance of non-constancy;

— identify procedures to correct instances of non-constancy.

The manufacturer shall draw up and keep up-to-date documents defining the factory production control. The manufacturer's documentation and procedures should be appropriate to the product and manufacturing process. The FPC system should achieve an appropriate level of confidence in the constancy of performance of the product. This involves:

a) the preparation of documented procedures and instructions relating to factory production control operations, in accordance with the requirements of the technical specification to which reference is made;

b) the effective implementation of these procedures and instructions;

c) the recording of these operations and their results;

d) the use of these results to correct any deviations, repair the effects of such deviations, treat any resulting instances of non-conformity and, if necessary, revise the FPC to rectify the cause of non-constancy of performance.

Where subcontracting takes place, the manufacturer shall retain the overall control of the product and ensure that he receives all the information that is necessary to fulfil his responsibilities according to this European standard.

If the manufacturer has part of the product designed, manufactured, assembled, packed, processed and/or labelled by subcontracting, the FPC of the subcontractor may be taken into account, where appropriate for the product in question.

The manufacturer who subcontracts all of his activities may in no circumstances pass the above responsibilities on to a subcontractor.

NOTE Manufacturers having an FPC system, which complies with EN ISO 9001 standard and which addresses the provisions of the present European standard are considered as satisfying the FPC requirements of the Regulation (EU) No 305/2011.

6.3.2.2 Equipment

6.3.2.2.1 Testing

All weighing, measuring and testing equipment shall be calibrated and regularly inspected according to documented procedures, frequencies and criteria.

6.3.2.2.2 Manufacturing

All equipment used in the manufacturing process shall be regularly inspected and maintained to ensure use, wear or failure does not cause inconsistency in the manufacturing process. Inspections and maintenance shall be carried out and recorded in accordance with the manufacturer’s written procedures and the records retained for the period defined in the manufacturer's FPC procedures.

6.3.2.3 Raw materials and components

The specifications of all incoming raw materials and components shall be documented, as shall the inspection scheme for ensuring their compliance. In case supplied kit components are used, the constancy of performance system of the component shall be that given in the appropriate harmonized technical specification for that component.

6.3.2.4 Traceability and marking

Individual products shall be identifiable and traceable with regard to their production origin. The manufacturer shall have written procedures ensuring that processes related to affixing traceability codes and/or markings are inspected regularly.

6.3.2.5 Controls during manufacturing process

The manufacturer shall plan and carry out production under controlled conditions.

6.3.2.6 Product testing and evaluation

The manufacturer shall establish procedures to ensure that the stated values of the characteristics he declares are maintained. The characteristics, and the means of control, are:

— Ability to release: shall be subject to the tests indicated in 5.2

— Self-closing ability: shall be subject to the tests indicated in 5.3

— Suitability for use on fire/smoke doors: shall be subject to the tests indicated in 5.4

— Durability of ability to release: shall be subject to the tests indicated in 5.6

— Durability for self-closing ability C: shall be subject to the tests indicated in 5.7

Table 39 — Minimum frequency of unit checks

Characteristics	Requirement	Assessment method	Minimum frequency
Ability to release (for locked doors on escape routes)			
Number of operations to release	4.2.1	5.2.1	Beginning of production
Operation of initiating element	4.2.2	5.2.2	6 months
Input signal from the Alarm system	4.2.3	5.2.3	6 months
Resetting conditions	4.2.4	5.2.4	6 months
Operating element	4.2.5	5.2.5	6 months
Fail safe function and failure of liaison and transmission paths	4.2.6	5.2.6	6 months
Release force - Door not under pressure	4.2.7	5.2.7	6 months
Release force - Door under pressure	4.2.8	5.2.8	6 months
Release from the initiating element	4.2.9	5.2.9	6 months
Release after power supply failure	4.2.10	5.2.10	6 months
Dimensional and design	4.2.11	5.2.11	Beginning of production
Door mass and door dimensions	4.2.12	5.2.12	Beginning of production

Characteristics	Requirement	Assessment method	Compliance criteria	Minimum number of samples / tests	Minimum frequency
Keepers	4.2.13	5.2.13	Pass/Fail	1	Beginning of production
Initiating element with cover	4.2.14	5.2.14	Pass/Fail	1	Beginning of production
Finger trapping	4.2.15	5.2.15	Pass/Fail	1	Beginning of production
Pictogram	4.2.16	5.2.16	Pass/Fail	1	Beginning of production
Time delay	4.2.17	5.2.17	Pass/Fail	1	Beginning of production
Central management control requirements	4.2.18	5.2.18	Pass/Fail	1	Beginning of production
Outside access device	4.2.19	5.2.19	Pass/Fail	1	Beginning of production
Security requirements	4.2.20	5.2.20	Pass/Fail	1	Beginning of production
Durability of ability to release (for locked doors on escape routes)					
Durability – General	4.6.1	5.6.1	Pass/Fail	1	Beginning of production
Abuse resistance of electrical locking element	4.6.2	5.6.2	Pass/Fail	1	Beginning of production
Abuse resistance of initiating element	4.6.3	5.6.3	Pass/Fail	1	Beginning of production
Abuse resistance of electrically lockable operating element	4.6.4	5.6.4	Pass/Fail	1	Beginning of production
Environmental requirements - Temperature range	4.6.5	5.6.5;	Pass/Fail	1	Beginning of production
Environmental requirements - Corrosion resistance	4.6.6	5.6.6	Pass/Fail	1	Beginning of production
Environmental requirements - Dry Heat resistance	4.6.7	5.6.7	Pass/Fail	1	Beginning of production

Environmental requirements - Cold resistance	4.6.8	5.6.8	Pass/Fail	1	Beginning of production
Environmental requirements - Damp heat cyclic resistance	4.6.9	5.6.9	Pass/Fail	1	Beginning of production
Environmental requirements - Impact resistance	4.6.10	5.6.10	Pass/Fail	1	Beginning of production
Environmental requirements - Supply voltage variations	4.6.11	5.6.11	Pass/Fail	1	Beginning of production
Electrical hazards safety	4.6.12	5.6.12	Pass/Fail	1	Beginning of production
Electromagnetic compatibility (EMC)	4.6.13	5.6.13	Pass/Fail	1	Beginning of production
Protection against solid foreign objects and ingress of water and dust (IP)	4.6.14	5.6.14	Pass/Fail	1	Beginning of production
Self-closing ability (for fire/smoke doors on escape routes)					
Self-closing	4.3	5.3	Pass/Fail	1	Beginning of production
Durability of Self closing ability C against aging and degradation (for fire/smoke doors on e scape routes)					
Durability – General	4.6	5.6	Pass/Fail	1	6 months
Suitability for use on fire doors					
Suitability of exit systems for use on fire resisting doorsets assemblies - Additional requirements	4.4	5.4	Pass/Fail	1	ITT satisfactory unless a change in materials or components
Control of Dangerous substances					
Dangerous substances	4.5	5.5	Pass/Fail	1	(continuous monitoring of raw material or components)

Beginning of production means at the commencement of a production line following a successful ITT.
A new ITT means a new production line.

6.3.2.7 Non-complying products

The manufacturer shall have written procedures which specify how non-complying products shall be dealt with. Any such events shall be recorded as they occur and these records shall be kept for the period defined in the manufacturer's written procedures.

Where the product fails to satisfy the acceptance criteria, the provisions for non-complying products shall apply, the necessary corrective action(s) shall immediately be taken and the products or batches not complying shall be isolated and properly identified.

Once the fault has been corrected, the test or verification in question shall be repeated.

The results of controls and tests shall be properly recorded. The product description, date of manufacture, test method adopted, test results and acceptance criteria shall be entered in the records under the signature of the person responsible for the control/test.

With regard to any control result not meeting the requirements of this European standard, the corrective measures taken to rectify the situation (e.g. a further test carried out, modification of manufacturing process, throwing away or putting right of product) shall be indicated in the records.

6.3.2.8 Corrective action

The manufacturer shall have documented procedures that instigate action to eliminate the cause of non-conformities in order to prevent recurrence.

6.3.2.9 Handling, storage and packaging

The manufacturer shall have procedures providing methods of product handling and shall provide suitable storage areas preventing damage or deterioration.

6.3.3 Product specific requirements

The FPC system shall address this European Standard and ensure that the products placed on the market comply with the declaration of performance.

The FPC system shall include a product specific FPC, which identifies procedures to demonstrate compliance of the product at appropriate stages, i.e.:

a) the controls and tests to be carried out prior to and/or during manufacture according to a frequency laid down in the FPC test plan,

and/or

b) the verifications and tests to be carried out on finished products according to a frequency laid down in the FPC test plan

If the manufacturer uses only finished products, the operations under b) shall lead to an equivalent level of compliance of the product as if FPC had been carried out during the production.

If the manufacturer carries out parts of the production himself, the operations under b) may be reduced and partly replaced by operations under a). Generally, the more parts of the production that are carried out by the manufacturer, the more operations under b) may be replaced by operations under a).

In any case the operation shall lead to an equivalent level of compliance of the product as if FPC had been carried out during the production.

NOTE Depending on the specific case, it can be necessary to carry out the operations referred to under a) and b), only the operations under a) or only those under b).

The operations under a) refer to the intermediate states of the product as on manufacturing machines and their adjustment, and measuring equipment etc. These controls and tests and their frequency shall be chosen based on product type and composition, the manufacturing process and its complexity, the sensitivity of product features to variations in manufacturing parameters etc.

The manufacturer shall establish and maintain records that provide evidence that the production has been sampled and tested. These records shall show clearly whether the production has satisfied the defined acceptance criteria and shall be available for at least three years.

6.3.4 Initial inspection of factory and of FPC

Initial inspection of factory and of FPC shall be carried out when the production process has been finalized and in operation. The factory and FPC documentation shall be assessed to verify that the requirements of 6.3.2 and 6.3.3 are fulfilled.

During the inspection it shall be verified:

a) that all resources necessary for the achievement of the product characteristics included in this European standard are in place and correctly implemented,

and

b) that the FPC-procedures in accordance with the FPC documentation are followed in practice,

and

c) that the product complies with the product type samples, for which compliance of the product performance to the DoP has been verified.

All locations where final assembly or at least final testing of the relevant product is performed, shall be assessed to verify that the above conditions a) to c) are in place and implemented. If the FPC system covers more than one product, production line or production process, and it is verified that the general requirements are fulfilled when assessing one product, production line or production process, then the assessment of the general requirements does not need to be repeated when assessing the FPC for another product, production line or production process.

All assessments and their results shall be documented in the initial inspection report.

6.3.5 Continuous surveillance of FPC

Surveillance of the FPC shall be undertaken once per year. The surveillance of the FPC shall include a review of the FPC test plan(s) and production processes(s) for each product to determine if any changes have been made since the last assessment or surveillance. The significance of any changes shall be assessed.

Checks shall be made to ensure that the test plans are still correctly implemented and that the production equipment is still correctly maintained and calibrated at appropriate time intervals.

The records of tests and measurement made during the production process and to finished products shall be reviewed to ensure that the values obtained still correspond with those values for the samples submitted to the determination of the product type and that the correct actions have been taken for non-compliant products.

6.3.6 Procedure for modifications

If modifications are made to the product, production process or FPC system that could affect any of the product characteristics declared according to this standard, then all the characteristics for which the manufacturer declares performance, which may be affected by the modification, shall be subject to the determination of the product type, as described in 6.2.1.

Where relevant, a re-assessment of the factory and of the FPC system shall be performed for those aspects, which may be affected by the modification.

All assessments and their results shall be documented in a report.

7 Classification and designation

7.1 General

For the purpose of this European Standard, an exit system shall be classified according to the 11 characters classification described in 7.2.

The classification reflects the ability of the exit system to achieve described performances. The actual configuration set up during installation shall be the purpose of the installation compliance report described in Table A3 of Annex A.

7.2 Classification system

7.2.1 General

The classification system of an exit system shall include the following 11 characters.

7.2.2 Category of use (1st character)

Only one grade of use shall be used:

— **Grade 3**: high frequency of use where there is little incentive to exercise care, i.e. where there is a chance of an accident occurring and misuse

7.2.3 Durability (2nd character)

The durability of the exit system shall be classified as one of the following four categories:

— **Grade 6**: 100 000 test cycles;

— **Grade 7**: 200 000 test cycles;

— **Grade 8**: 500 000 test cycles;

— **Grade 9**: 1 000 000 test cycles.

See 4.6.

7.2.4 Door mass (3rd character)

Nine grades of door mass and closing force are identified.

Table 40 — Door mass and Closing Force

Grade	Door mass	Closing force
Grade 1	up to 100 kg door mass	50 N maximum closing force
Grade 2	up to 200 kg door mass	50 N maximum closing force
Grade 3	above 200 kg door mass or as specified by the manufacturer	50 N maximum closing force
Grade 4	up to 100 kg door mass	25 N maximum closing force
Grade 5	up to 200 kg door mass	25 N maximum closing force
Grade 6	above 200 kg door mass or as specified by the manufacturer	25 N maximum closing force
Grade 7	up to 100 kg door mass	15 N maximum closing force
Grade 8	up to 200 kg door mass	15 N maximum closing force
Grade 9	above 200 kg door mass or as specified by the manufacturer	15 N maximum closing force

7.2.5 Suitability for use on fire/smoke doors (4th character)

The suitability of the emergency exit system for use on fire/smoke doors shall be classified as one of the following three grades:

— **Grade 0**: not approved for use on fire/smoke door assemblies;

— **Grade A**: suitable for use on smoke door assemblies based on a test in accordance with EN 1634-3;

— **Grade B**: suitable for use on smoke and fire door assemblies based on a test in accordance with EN 1634-1 or EN 1634-2.

7.2.6 Safety (5th character)

Only one grade of safety shall be used:

— **Grade 1**: all exit systems have a critical safety function, therefore only the top grade is identified for the purpose of this European Standard.

7.2.7 Corrosion resistance, humidity and IP protection (6th character)

Requirements according to where the electrically controlled exit systems are installed they shall be classified a one of the following three grades:

— **Grade 0** = indoor zone

— **Grade 1** = indoor zone where condensation may occur

— **Grade 2** = outdoor zone

Table 41 — Detail of grades for Corrosion resistance, humidity and IP protection (6th character)

Requirement		Test methods - procedures	Grades		
			0	1	2
4.6.6	Environmental requirements - Corrosion resistance requirement (Durability of ability to release) to EN 1670	5.6.6	Grade 0 EN 1670	Grade 1 EN 1670	Grade 3 EN 1670
4.6.9	Environmental requirements - Damp heat cyclic (12h + 12h) resistance requirement (Durability of ability to release)	5.6.9	no	yes	yes
4.6.14	Environmental requirements – IP Protection against solid foreign objects and ingress of water and dust (Durability of ability to release)	5.6.14	IP 30	IP 32	IP 44

7.2.8 Security/Holding force – from outside (7th character)

The security/holding force of the exit system shall be classified as one of the following five grades:

This concerns electrical locking element and electrically lockable operating element, and combination of electrical locking element and mechanical exit device

— **Grade 2**: 1 000 N**;**

— **Grade 3**: 2 000 N;

— **Grade 4**: 3 000 N;

— **Grade 5**: 5 000 N;

— **Grade 6**: > 5000 N to be defined in product information.

See 4.2.20.1

7.2.9 Security/Holding force – from inside (8th character)

The security/holding force from inside of the exit system shall be classified as one of the following six grades:

This concerns electrical locking element and electrically lockable operating element

— **Grade 1**: 500 N

— **Grade 2**: 1000 N;

— **Grade 3**: 2000 N;

— **Grade 4**: 3000 N;

— **Grade 5**: 5000 N;

— **Grade 6**: > 5000 N to be defined in product information.

See 4.2.20.2

7.2.10 Time delay (9th character)

The time delay of the exit system shall be classified as one of the following three grades:

— **Grade 0**: No time delay;

— **Grade 1**: Single time delay

  — t1 = 15 s maximum;

— **Grade 2**: Double time delay

  — t1 = 15 s maximum;

  — t2 = 180 s maximum.

See 4.2.17.

7.2.11 Denied exit mode (10th character)

The denied exit mode of the exit system shall be classified as one of the following two grades:

— **Grade 0**: no denied exit (safe at all times);

— **Grade 1**: denied exit available (safe during defined time zone).

NOTE Grade 1 is only available when associated to a Central Management Control (CMC).

See 4.2.18.2.4.

7.2.12 Configuration (11th character)

The configuration of the exit system shall be classified as one of the following five categories:

— **Category A** - Initiating element being integrated in and activated by a horizontal bar in accordance with EN 1125.

— **Category B** - Initiation element being installed outside the door leaf as part of an exit system which is functionally not linked to an exit device.

— **Category C** - Initiating element being integrated in and activated by a dummy bar or a dummy handle that is not an operating element.

— **Category D** - Other exit system not being included in any of the above mentioned categories.

See 4.2.1 and Annex F.

7.3 Example of classification

The classification of the exit system shall be presented as per the following example:

3	**7**	**2**	**B**	**1**	**1**	**4**	**5**	**1**	**1**	**A**

This denotes an electrically controlled exit system tested for 200 000 cycles, suitable for use on fire/smoke door assemblies, up to 200 kg door mass, 50 N maximum closing force.

IP32 suitable for use in indoor zone where condensation may occur, with a security holding force from outside of 3 000 N, with a security holding force from inside of 5 000 N, with 15 s maximum single time delay, with a denied exit mode, Initiating element being integrated in and activated by a horizontal bar in accordance with EN 1125 (category A).

8 Marking, labelling and packaging

8.1 On the product

The information according to Table 42 shall be marked on the controlling element or locking element (where controlling element is incorporated):

a) manufacturer's name or trademark or other means of positive identification;

b) the dated reference to the harmonized technical specification applied, i.e. EN 13637;

c) month and year of manufacture.

Only items a) shall need to be accessible after installation. Item c) may be in coded form.

8.2 On the packaging

The following information according to Table 42 shall be marked on the packaging of each element forming part of the exit system:

a) manufacturer's name or trademark or other means of positive identification;

b) manufacturer’s product reference number.

8.3 On the installation instructions

The information given in Table 42 shall be marked on the installation instructions.

Table 42 — Marking provisions

Marking requirements	On the product (device mechanism and/or operating element)		On the packaging of each element	On the installation instructions
	Visible before installation	Accessible after installation		
Name or identifying mark of the manufacturer	-	X	X	X
Registered address of the manufacturer	-	-	-	X
Reference to this European standard (number and year)	X	-		X
Classification		-	-	X
Month and year of assembly by manufacturer	X	-	-	-
Manufacturer's product reference number	-	-	X	X
Information on the list of the only approved components forming part of the exit system (operating elements, keepers, initiating element, etc.)	-	-	-	X

Where regulatory marking provisions require information on some or all items listed in this clause, the provisions of this clause concerning those common items are deemed to be met.

Annex A
(informative)

Information supplied with the product

A.1 General

An exit system manufactured to this European Standard shall be supplied with clear and detailed instructions for its installation and maintenance to ensure a proper and safe use.

NOTE 1 It is advisable that this information to be supplied with the controlling element and the other components of the exit system be supplied with information referring to the technical documentation supplied with the controlling element.

The Product information shall include documents for the different stakeholders in accordance with Table A.1:

Table A.1 — Product information

Document	Staff/owner	Installer/Service	Test lab
User manual	X	X	X
Installation manual		X	X
Function control - user	X	X	X
Maintenance instruction - service	X	X	X
Maintenance records	X	X	X
Relevant drawings for testing			X
Circuit diagram			X
Component listing			X
Component diagram			X
Printed Circuit Board layout			X
Identification label of each initiating, locking, operating and controlling element			X
Data sheet of safety relevant components			X
Certificates of safety relevant components			X
Component relevant specifications			X
Intended classification			X
Safety relevant software documentation			X

These instructions shall contain the following:

a) the limitations on its intended use, the limitation of the door mass and door dimensions, the field of door application, the power consumption. Where a dogging function is available for use on a fire/smoke resisting doorset, it shall be clarified if this is suitable for use on latched fire doors with a smoke/alarm system and/or on unlatched fire doors (see 4.4);

b) installation and fixing instructions to ensure that the exit system can achieve the performance requirements in this document, including any restriction in use, for example conditions under which the exit system could be rendered inoperable. See 4.2.19.

c) maintenance instructions to ensure that the exit system continues to achieve the performance requirement in this document for a reasonably economic working life;

d) a list of all elements that are tested and approved for use with this exit system and which may be packaged separately, e.g. initiating element, operating element, locking element, controlling element, mortise lock, lever handle, cylinder, keeper, etc.

e) Where an assembly is using different accessories, the manufacturer shall clearly identify configurations that are acceptable within the product family and those which are not (i.e. using a table).

f) It is of paramount importance that an exit system shall be installed as defined by the manufacturer and equipped with properly compatible components and/or accessories. Therefore, this information shall be available in the manufacturer's instructions.

NOTE 2 For liability reasons it is important that the particular combination of the different components comprising the exit system is proved to comply with the requirements of this standard.

g) a controlling element shall be supplied with an installation compliance report form

NOTE 3 The compliance report form may be completed by the installer after installation of the exit system in order to provide clear information on the approved components of the exit system installed, and to prevent unacceptable combination of products or elements.

The following should be the minimum information provided by the Manufacturer with the exit system.

A.2 Product information

The product information should be supplied with the product in order to verify that the product meets the expectations of the stakeholder.

Table A.2 — Example of product information

Manufacturer	
Components of the Electromechanical Exit (system)	
Initiating element (I)	ref xxxxxx
Electrical Controlling element (C)	ref xxxxxx
Electrical Locking element (L)	ref xxxxxx
Panic or Emergency exit device (where applicable)	ref xxxxx
Central Management Control element (CMC) (where applicable)	ref xxxxx
NOTE	(for example, if elements are supplied from another manufacturer)
Standard and classification	
Intended use	
Durability	
Suitability for use on fire/smoke doors	
Security / holding force	
Time delay	
No Time delay (t0)	Yes / No
Single time delay (t1)	
Double time delay (t2)	
Denied exit mode	Yes / No
Number of operation(s)	1 or 2
System configuration	(using also an illustration)
Performance criteria	
Identification and Marking	
Etc.	

A.3 Installation and fixing instructions

A.3.1 Fixing arrangements

The exit system should be supplied with the fixing arrangements suitable for the door types for which the exit system is designed.

A.3.2 Information and installation guidance

The exit system should be supplied with the following minimum information and installation guidance:

1) Before fitting an exit system to a door, the door should be checked to ensure correct hanging and free from binding.

NOTE 1 It is not recommended, for example, that exit systems be fitted to hollow core doors unless specially designed by the manufacturer for this type of doors.

NOTE 2 It is recommended to verify that the door construction allows the use of the system, i.e. to verify that offset hinges and engaging leaves allow both leaves to be opened simultaneously or to verify that the gap between door leaves does not differ from that defined by the exit system manufacturer, or to verify that the operating elements do not interfere, etc.

NOTE 3 Exit systems manufactured in accordance with this European Standard will provide a high degree of safety and reasonable security provided that they are fitted to doors and door frames that are in good condition.

2) Before fitting an exit system to a smoke/fire-resisting door, the fire certification should be examined to ensure the suitability of the exit system for that particular door assembly.

3) Care should be taken to ensure that any seals or weather-stripping fitted to the complete door assembly, do not inhibit the correct operations of the exit system.

4) On double doorsets with rebated meeting stiles and where both leaves are fitted with exit systems, it is essential to check that either leaf will open when its exit system is activated and also that both leaves will open freely when both exit systems are operated simultaneously. The use of a carry bar to move the active leaf may be required for this application.

5) Where exit systems are manufactured in more than one size, it is important that the correct size is selected.

6) Exit systems with standard projection (<100 mm) should be used in situations where there is restricted width for escape, or where the doors to be fitted with the exit systems are not able to open beyond 90°.

7) Where an exit system is designed to be fitted to a glazed door, it is essential that the glazing is tempered or laminated glass.

8) Different fixing can be required for fitting exit systems to wood, metal or frameless glass doors. For more secure fixing, male and female through-door bolts, reinforcement and rivets can be used.

9) Exit systems are not intended for use on double action (double swing) doors unless specifically designed by the exit device manufacturer.

10) The fixing instructions should be carefully followed during installation. These instructions and any maintenance instructions should be passed on by the installer to the user.

11) The operating element should normally be installed at a height of between 900 mm and 1 100 mm from the finished floor level, when the door is in the secured position. Where it is known that the majority of the users of the premises will be young children, consideration should be given to reducing the height of the operating element.

12) The initiating element should normally be installed at a height of between 800 mm and 1 200 mm from the finished floor level, on the inside door face or at not more than 600 mm from the leading edge of the inside door face. Where it is known, that the majority of the occupants of the premises will be young children, consideration should be given to reducing the height of the initiating element.

13) When installing lever operated exit systems on doors with raised or recessed surfaces, consideration should be given to minimizing any potential safety risks, such as the trapping of fingers or clothing.

14) The bolt heads and keepers should be fitted to provide secure engagement. Care should be taken to ensure that no projection of the bolt heads, when in the withdrawn position, can prevent the door swinging freely.

15) Where exit systems are to be fitted to double doorsets with rebated meeting stiles and self closing devices, a door coordinator device in accordance with EN 1158 (see Bibliography) should be fitted to ensure the correct closing sequence of the doors. This is particularly important with regard to smoke/fire-resisting door assemblies.

16) No devices for securing the door in the closed position should be fitted other than that specified in this European Standard. This does not preclude the installation of self-closing devices or denied exit mode.

NOTE 4 Denied exit can optionally be available with a CMC. See 4.2.18.2.4.

Where denied exit mode is used, authorized people should have the key to override the exit denied mode.

17) If a door closing device is to be used to return the door to the closed position, care should be taken not to impair the use of the doorway by the young, elderly and infirm.

18) A sign should be provided on the inside face of the door to indicate this is a controlled exit system;

The initiating element function pictogram, if supplied separate from the initiating element, should be installed adjacent to the initiating element.

The surface area of the pictogram should be not less than 8 000 mm2 (or 2500 mm2 if the surface of the pictogram is actively illuminated) and its colours should be white on a green background. The pictogram given in Figure 2 can be used.

19) The installer should refer to the technical documentation supplied with the controlling element to check that he has available all the required and approved components of the exit system.

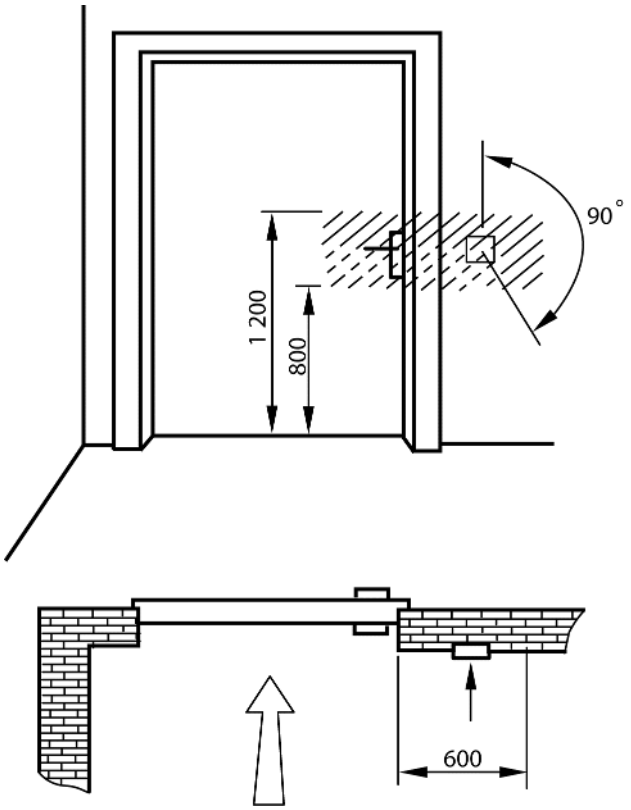


Figure A.1 — Example position for the initiating element 1

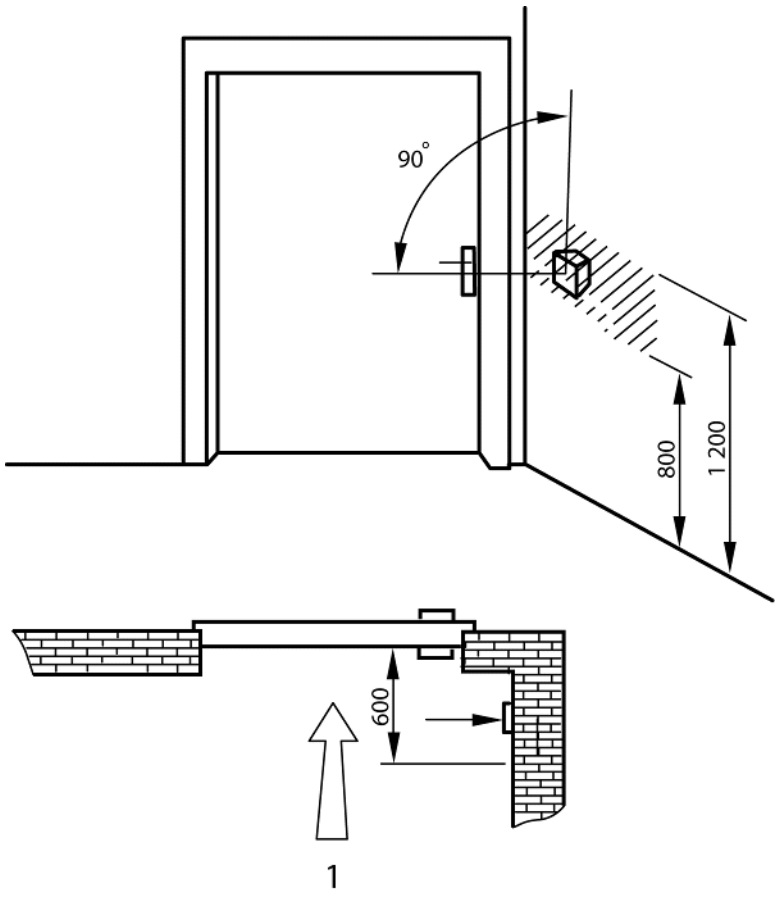


Figure A.2 — Example position for the initiating element 2

A.4 Installation compliance report form

The exit system should be supplied with an installation compliance report form. The following should be the minimum information to accompany the exit system.

Table A.3 — Example of Installation compliance report

Record of system installed to EN 13637		
Manufacturer's name		
Door location into the building, or reference.		
Dated version of Standard used Model number for each element of the exit system (checked against Manufacturer's parts list) Classification to EN 13637 according to the configuration of the door List of any additional elements incorporated Door details (size, mass, fire rating, etc.) Initiating element installation position Date of installation		
Safety related functions available or not with the product installed		
Function or characteristic	Possible answers allowed by the standard	Functions available with the product installed
Suitability for use on fire/smoke resisting doors	0: not suitable A: Smoke doors B: Fire doors	
Type of door	Single door Inwardly opening single door Double door	
Maximum door dimensions	Actual value	
Door mass	Actual value	
Durability	Number of cycles	
Corrosion resistance grade	Resistance level	
Security grade (outside)	2 = 1000N 3 = 2000N 4 = 3000N 5 = 5000N	
Type of operating element	Emergency exit device to EN 179: A = lever handle B = push pad Panic exit device to EN 1125: A = push bar B = touch bar	

	Other	
Type of initiating element	push button	
	horizontal bar	
	lever handle	
	push pad	
Number of operation(s) to release the door	1 operation only	
	2 operations maximum	
Link to Alarm system - Immediate release after receiving signal or - Immediate release after receiving signal and request with initiating element by cancelling time delay and/or denied exit mode	Yes / No	
Time delay	0: no time delay (t0)	Yes / No
	1: single time delay (t1) (× second)	
	2: double time delay (t1 + t2)	
Denied Exit mode	0: no denied exit (safe at all times)	
	1: denied exit available (safe during defined time zone)	
Central management control	Yes / No	
Signalling functions	According to installation instructions	
Outside operating element	According to installation instructions	
Additional functions not covered by the standard but offered by the manufacturer		
Checks carried out at the time of installation		
Outside access device does not inhibit operation of the exit system		
Door swings freely after release		
Immediate release after power interruption		
Immediate release after reception of the detection order of the Alarm system (if applicable on restricted alarm)		
Remote resetting procedure		
Fitting of initiating element function pictogram and signage		
Instructions passed to user		
Release checks:	immediate	
	against door load	

	time delay function (where applicable) extended time delay (where applicable)	
Re-engagement check Reset check Date of above checks Name and signature of installer Date for first inspection		

A.5 Maintenance instructions

The following should be the minimum information to accompany the product:

To ensure performance in accordance with this document, the following routine maintenance checks should be undertaken at intervals of not more than one year (or a shorter period specified by the manufacturer):

a) Inspect and operate the exit system to ensure that all components are in a satisfactory working condition. Using a force gauge, measure and record the operating forces to release the exit system.

b) Ensure that the keeper(s) is (are) free from obstruction.

c) check that all fixings are secure;

d) Check that the exit system is lubricated in accordance with the manufacturer's instructions.

e) Check that that no additional locking devices have been added to the door since its original installation.

f) Check periodically that all components of the exit system are still correct in accordance with the list of approved components originally supplied with the exit system.

g) Check periodically that the operating element is correctly tightened and, using a force gauge, measure the operating forces to release the exit system. Check that the operating forces have not changed significantly from the operating forces recorded when originally installed.

A.6 Routine site inspection report form

The exit system should be supplied with a routine site inspection report form according to A.2. The following should be the minimum information to accompany the exit system.

In order to ensure that the exit system is in a satisfactory working condition, a routine site inspection should be undertaken at regular intervals.

Table A.4 — Example of routine site inspection report

Checks carried out at the time of inspection:	
Check all the exit system components against the record of installed components	
Outside access device does not inhibit operation of the exit system	
Door swings freely after release	
Immediate release after power interruption	
Immediate release after reception of the detection order of the Alarm system (if applicable on restricted alarm and where applicable)	
Remote resetting procedure	
Fitting of initiating element function pictogram	
Release checks:	
immediate	
against door load	
time delay function (where applicable)	
extended time delay (where applicable)	
Re-engagement check	
Reset check	
Check the secure fixing of the components	
Date of inspection	
Signature of inspector	
Date for next inspection	

This inspection report form should be completed by an approved inspector and handed to the owner after inspection. This page is allowed to be copied for use by the inspector

Annex B
(normative)

Test sequences with different samples

Each test with the different samples A, B, C, D and E shall be completed by the sequence as stated in Table B.1, from top to bottom of each column.

Table B.1 — Test procedures

Sample A	Sample B	Sample C	Sample D and E
Design verification and mechanical and electrical performance tests	**Electrical safety tests and Environmental performance tests**	**Any test to be repeated in case of failure**	**Fire test with a doorset (where applicable)**
Visual inspection, functional test and/or measurements for verification of design requirements for ability to release: 5.2.1, 5.2.2, 5.2.6, 5.2.11, 5.2.12, 5.2.13, 5.2.14, 5.2.15, 5.2.16, 5.2.19	5.6.5 Temperature	See 5.1.1 and adequate clause to repeat the test	5.4
5.2.3 Release function - Input signal from the Alarm system	5.6.6 Corrosion		
5.2.4 Resetting conditions			
5.2.17 Release test according to time delay			
5.2.9 Release from the initiating element			
5.2.7 Release force not under pressure	5.6.7 Dry heat		
5.2.8 Release force under pressure	5.6.8 Cold		
	5.6.9 Damp heat		
5.2.6 Test of fail-safe function and failure of liaison and transmission paths, and release force test of initiating element	5.6.10 Impact		
5.2.18 Release according to time delay	5.6.11 Supply voltage		
5.2.10 Release after power failure	5.6.12 Electric hazards		
5.6 and 5.7 Durability	5.6.13 EMC		
5.6.2, 5.6.3, 5.6.4 Abuse	5.6.14 IP protection		
5.2.20 Security			
5.3 Self closing ability C		See 5.1	

Annex C
(informative)

Guidance for choosing relevant product standards for particular exit door applications

The final choice of a product for a particular application depends upon a risk analysis of its intended use on exit doors. Table C.1 indicates the main performance requirements of the **three** exit hardware standards, to enable this risk assessment to be undertaken.

In case of any doubt, a panic situation should be assumed, and therefore preference should be given to exit systems based on panic exit devices and as these give precedence to safe exit from buildings through additional requirements for release under loaded door conditions. These requirements simulate the forces which may be applied by people in panic. See Introduction to EN 1125.

Table C.1 — Main functions of exit devices and systems

Standards ➔ Functions ↓	**PANIC EXIT DEVICES** **mechanically operated** EN 1125	**EMERGENCY EXIT DEVICES** **mechanically operated** EN 179	**EXIT SYSTEMS** **electrically controlled** EN 13637	
EXIT FROM INSIDE UNDER PANIC OR EMERGENCY CONDITIONS (with or without external alarm signal)	**PANIC situation:** Operating element: horizontal bar in the direction of exit to release the door Loaded door release test of the device No prior knowledge of device operation needed Single operation	**EMERGENCY situation:** Operating element: lever handle in a downward direction or push pad in the direction of exit Doors might open in the direction opposite to the exit Prior knowledge of device operation may be required Single operation	**Based on Emergency Device** Operating element to EN 179: lever handle in a downward direction (doors might open in the direction opposite to the exit) or push pad in the direction of exit to release the door* Operating element to EN 1125 can also be used Prior knowledge of system operation may be required Single operation or two operations	**Based on Panic Exit Device** Operating element to EN 1125: horizontal bar in the direction of exit to release the door* Loaded door release test of the device Or no operating element No prior knowledge of system operation needed Single operation Or two operations accepted: - if illuminated initiating element (if separated) - otherwise, if the system is limited with an external fire detector or alarm system.
			Status Monitoring from CMC (when existing), to show the door status Release and/or Open the doors from CMC (when existing)	
NORMAL EXIT FROM INSIDE UNDER USUAL CONDITIONS	Exit authorised at all times	Exit authorised at all times	Electrically controlled exit Optional denied exit mode subject to national regulation Optional time delay subject to national regulation and authorised if the system is in connection with a CMC	
ACCESS CONTROL	Access granted from outside	Access granted from outside	For access from outside and inside	
SECURITY FROM INSIDE	NONE: immediate release of the device	NONE: immediate release of the device	YES: controlled release possible thanks to time delay and/or denied exit mode, subject to national regulations	
SECURITY FROM OUTSIDE	Minimum level Optional deadbolt can be added	Minimum level or higher grades possible (with e.g. a deadbolt)	Minimum level or higher grades possible (with e.g. a deadbolt) Access granted from outside (access control)	

When the exit system does not include an operating element, then no operation might be needed to mechanically release the door when an alarm signal has been received.

Annex D
(informative)

Access levels, Installation and maintenance

D.1 Access levels

D.1.1 Definitions

According to the different situations of operation, functions and maintenance the exit system deals with necessary precautions to avoid unsafe situations according to staff skills and responsibility.

— access level **0** (for use by the public)

Commands and signals without any compromising safety risk accessible by any people without any tool or key.

EXAMPLE Activation of the initiating element.

— access level **I** available to authorized personnel for general purpose of building exit system supervision

Commands and signals accessible in specific safety premises or physically protected for is access against public people; normally intended for a normal management situation in reaction of a signal, without any tool or identification ID.

EXAMPLE Releasing of the exit door after a request from a door which can be released by the CMC.

— access level **II** available to authorized personnel for particular safety situations in the exit system supervision

Commands and signals accessible to authorized staff only, responsible and trained for particular functions, able to appreciate the belonging consequences. The actions are susceptible to modify the state of the exit system and supposed to be achieved with specific identification means (e.g. Identification Device, key,…).

EXAMPLE Reset of the general exit doors releasing on the door side and/or CMC.

— access level **III** available to entitled staff for installation and maintenance

Only for commands and signals accessible to entitle staff in charge of set-up installation or maintenance operation according to the manufacturer instructions.

Replacement of some spare-parts, or set up of software for building settings only, responsible and trained for particular functions, able to appreciate the belonging consequences. The actions are susceptible to modify the state of the exit system and supposed to be achieved with specific tools (screw driver,…) and/or identification means (e.g. ID, key,…).

EXAMPLE Replacement at the identical of the initiating element, set-up of time delay or exit door groups definition.

— access level **IV** available to staff entitled by the manufacturer

Corresponds to all intervention not defined on lower levels.

EXAMPLE Replacement of microprocessor, modification of firmware.

D.1.2 Access levels for typical operations on the electrically controlled exit system

Access level I

— The start and the end of t2 after a door opening request (See 4.2.18.2.5)

— Deactivation of Denied exit mode function (See 4.2.18.2.4)

— Activation of general safety release push button on the CMC (See 4.2.18.2.3)

— Activation of Test button on the CMC, to light the CMC display elements and sound as long as the button is activated. (See 4.2.18.2.6)

Access level II

— All manual resets, excepted after a failure has been fixed on a door (See Table 1 in 4.2.4)

— Activation of time delay function t1 or t2 (See 4.2.18.2.5)

— Activation of Denied exit mode function (See 4.2.18.2.4)

Access level III

— Manual reset after a failure has been fixed on a door (See Table 1 in 4.2.4)

— Activation or not of the audible signal on the CMC, during the installation set up (See 4.2.18.2.6)

D.1.3 Installation

Care should be taken that any seals or weather-stripping fitted to the complete door assembly do not inhibit the correct operations of the panic or emergency exit device.

On double doorsets with rebated meeting stiles, and where both leaves are fitted with exit devices, it is essential to check that either leaf will open when its exit device is activated and also that both leaves will open freely when both exit devices are operated simultaneously.

The operating element should normally be installed at a height of between 800 mm and 1 100 mm from the finished floor level, when the door is in the secured position. Where it is known that the majority of the occupants of the premises will be young children, specifiers should reduce the height of the operating element.

The bar of a panic exit device should be installed so as to provide the maximum effective length.

Where exit devices are to be fitted to double doorsets with rebated meeting stiles and self-closing devices, a door coordinator device conforming to EN 1158 and a carry bar should be fitted to ensure the correct closing sequence of the doors.

NOTE This is particularly important with regard to fire/smoke-resisting door assemblies.

If a door closing device is to be used to return the door to the closed position, care should be taken not to impair the use of the doorway by the young, elderly and infirm

When installing lever handle or push pad operated emergency exit devices, particularly on doors with raised or recessed surfaces, specifiers should minimize any potential safety risks, such as the trapping of fingers or clothing.

D.1.4 Maintenance

As stated in manufacturers' installation and fixing instructions, the following routine maintenance checks should be undertaken at intervals of not more than 1 month by the occupier or an approved representative:

— inspect and operate the exit device to ensure that all components are in a satisfactory working condition;

— ensure that the keeper(s) is (are) free from obstruction;

— check that the exit device is lubricated in accordance with the manufacturer's instructions;

— check that no additional locking devices have been added to the door since its original installation;

— check that the doorway is without any obstruction preventing the door from being fully opened.

A check should be made yearly that all components of the panic or emergency exit device are still correct in accordance with the list of approved components originally supplied with the system. Repair or replace the device as required.

D.2 Advantages/disadvantages of panic and emergency exit devices and systems

D.2.1 Design of operating elements

Design of operating elements of exit devices, such as horizontal bars, lever handles or push pads may help the "less able". Specifiers should define the ergonomics of the exit device.

For EN 1125 exit devices operated by horizontal bars, type A bars may allow a better grip for the hand, especially when the door is not equipped with a door closing device, whereas type B bars may be more suitable for use in places where abuse may be more likely to occur.

NOTE According to the situation, it may be advisable to install the horizontal bar at a lower position than normal to allow for operation by young children (i.e. in kindergartens) or people in wheelchairs; alternatively, a device with two horizontal bars may also be chosen.

For EN 179 exit devices operated by lever handles or push pads, type A lever handle operated devices might be easier to operate by small children simply by hanging onto the lever handle. Type B push pad operated devices may be more suitable for use in places where abuse may be more likely to occur.

D.2.2 Design of outside access device

Specifiers should define the ergonomics of any outside access device. Also, the use of electronic outside access systems, such as transponder, proximity technology, etc. may prevent the need for mechanical cylinder key operations.

D.2.3 Low operating forces

An exit device will operate, with no load condition, with operating forces not exceeding 80 N for a bar operated panic exit device, 70 N for a lever handle operated emergency exit device or 150 N for a push pad operated emergency exit device. Although this may be sufficient in most cases, it may not be sufficient with loaded door conditions.

Door operating forces not only depend on the exit device but also on the construction of the door and its equipment, especially with the use of compression seals, door closing devices, etc.

When choosing an exit device according to the intended use, it may be useful to seek advice from the manufacturer about release forces of the device and its durability in test conditions with a 25 N load and/or with different loads applied to the door.

Table D.1 — Operating forces

	Maximum operating force requirements in the standards	
Exit device	Emergency situation (no load on test door)	Panic situation (1 000 N load on test door)
EN 1125 — type A or B (with horizontal bar)	Maximum 80 N	Maximum 220 N
EN 179 — type A (with lever handle)	Maximum 70 N	Not applicable
EN 179 — type B (with push pad)	Maximum 150 N	Not applicable

Operating force by children, elderly and disabled people should not exceed the shown maximum values for an emergency situation, even with 25 N load applied to the door leaf (during durability test).

D.2.4 Bottom vertical rods and projecting floor sockets

Surface applied bottom vertical rods and projecting floor sockets should be avoided to prevent abuse by wheelchairs. Alternatively, bottom vertical rods protected by strong cover or guard can be used.

D.2.5 Automatic locking

Specifiers should select an automatic locking feature that allows for automatic deadbolting of the device which does not require any manual operation to relock a door.

D.2.6 Dogging mechanism

When a door does not need to be locked all the time, specifiers should select a dogging mechanism, which makes it easier to use the door by holding the bolt heads in their withdrawn position until manually reset.

NOTE This may be in conflict with the suitability of the exit device for use on fire / smoke-resisting doorsets.

D.2.7 Electrically controlled functions

Panic and emergency exit systems conforming to EN 13637 are primarily designed to control exit and access and provide higher security while conforming to safety requirements (linked to alarm system of the building).

Specifiers should select such systems to ease access and exit.

D.2.8 Projection of the exit device

Exit devices should be used with low projecting operating elements (horizontal bar, lever handle, push pad) to allow wider door openings, thus facilitating the passage of wheelchairs.

D.2.9 Recognition of operating element

Visually impaired people may have difficulty in recognizing the exit door and/or its operating element. Specifiers should ensure a minimum contrast between the operating element and the surface of the door leaf. Minimum contrast should be 30 % on a grey scale.

D.3 Operating forces declared by the manufacturer

D.3.1 General

Operating forces of exit devices, either by hand (i.e. through horizontal bar, lever handle or push pad) or fingers (key operated outside operating element, etc.), depend to a large extend on the installation of the door and the pressure from the seals. To overcome these, exit devices manufacturers have developed over years specific products that have low operating forces with load applied to the door.

In order to allow for the correct choice of exit systems, especially when accessibility to the mobility impaired is a priority concern, it is advisable to take into account operating forces of exit system under side load expected from the door construction. The requirements, test methods and manufacturer's model declaration below will allow providing such information in a consistent way.

D.3.2 Performance assessment

Using the test methods described below, record the operating force needed to operate the exit device or system with one or more of the different side loads applied to the door. A model declaration is proposed in Table D.2.

NOTE The manufacturer may choose one or more side load to be declared, according to purpose.

D.3.3 Test methods - Operating tests under side load

Using the same installation as for the tests defined in 5.1.2.1 to 5.1.2.2, apply to the test door the load at a position of 550 mm from the centre line of the hinges of the test door leaf and between 800 mm and 1 200 mm from the bottom of the test door in the direction opposed to the door opening. Alternatively, the measure can be made at 1050 mm from the hinges (in order to use the same test door as locks).

According to the type of operating element:

a) Horizontal bar:

With the test door secured, the horizontal bar should be actuated by a force at three successive positions along the bar, midpoint and within a maximum of 25 mm from each end of the horizontal bar. Measure the forces needed to release the exit device or system.

This test should be conducted three times at each position.

b) Lever handle:

With the test door secured, the lever handle should be actuated by a force at 100 mm from the axis of rotation of the lever handle. Measure the forces needed to release the exit device or system.

This test should be conducted three times.

c) Push pad:

With the test door secured, the push pad should be actuated by a force at the midpoint of its operating surface. Measure the forces needed to release the exit device or system.

This test should be conducted three times.

D.3.4 Manufacturer's declaration

In order to provide a consistent way for product information, the manufacturer will choose to declare operating forces / torques with side load applied to the door and he should use the format in Table D.2. This will form part of the product information.

In addition to the design and performance requirements as detailed in this European Standard, the following information can be supplied by the manufacturer to show the accessibility performance of their products and to allow for the choice of the lock best suited for the intended application.

Table D.2 — Model for operating forces declared by the manufacturer for exit systems

	Units					
Side load applied to the door at 550 mm from the hinges to simulate seals pressure	N	**30N**	**50N**	**95N**	**230N**	**> 230N** (specify)
Alternatively at 1050 mm from the hinges	N	**15N**	**25N**	**50N**	**120N**	**> 120N** (specify)
Operating force to release the locking points from inside: - Lever handle (force measured at 100 mm from the axis of rotation of the handle) - Push pad (force measured in the midpoint of its operating surface) - Horizontal bar (force measured at 3 different points, in the middle and at 25 mm from each bar end)	N					

NOTE The side load applied to the locking points alongside the door edge is half of the force applied to the centre of the 1 100 mm wide test door.

Annex E
(informative)

Functional diagrams

E.1 Functional diagrams of typical electrically controlled exit systems

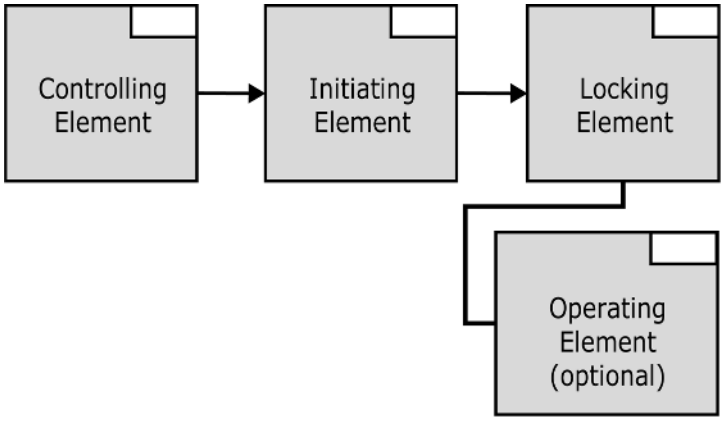


Figure E.1 — Exit system with minimum functions

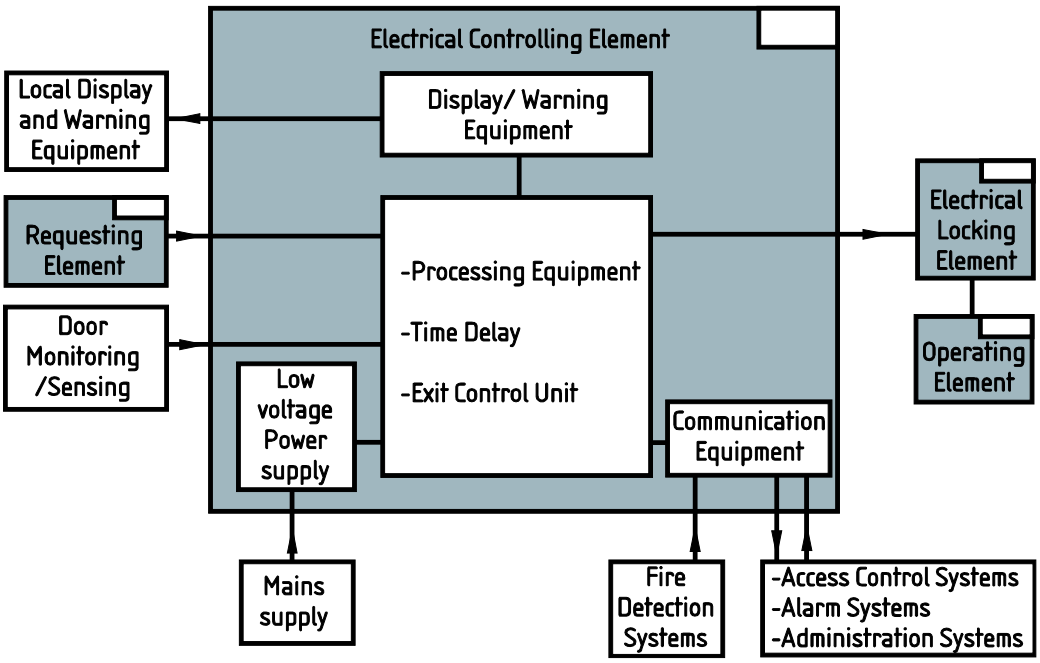


Figure E.2 — Exit system with comprehensive functions

NOTE Some functions may be distributed in more than one unit, or may be integrated into a common unit.

E.2 Logic diagram for modes of exit system operation

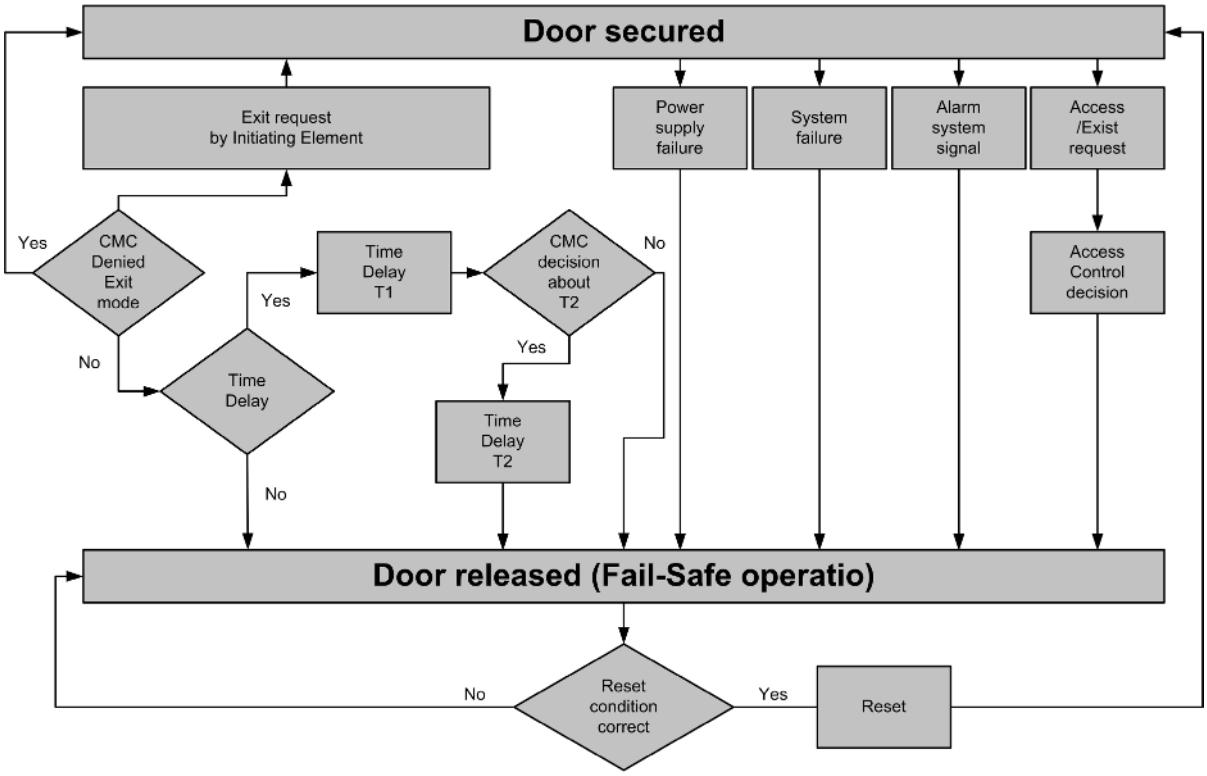


Figure E.3 — Door used for emergency exit and manual access/exit

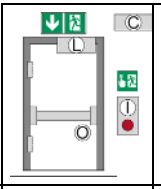
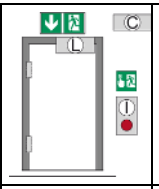
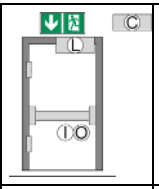
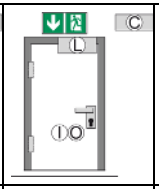
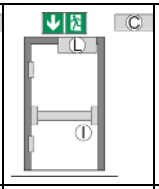
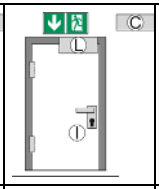
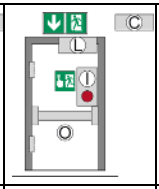
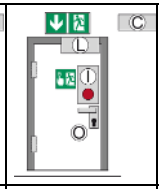
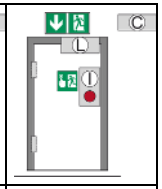
Annex F
(informative)

Examples of configurations and description of exit systems

F.1 Configuration of exit system

An electrically controlled exit system concerns one door and fulfils the individual requirements of the panic or emergency exit. Different configurations for particular applications are given in Table F.1.

Table F.1 — Examples of configuration of exit systems

	Type	 A	 B	 C	 D	 E	 F	 G	 H	 I	 J
Initiating (I)	1. Button	**x (1st operation)**	**x (1st operation)**	**x**					**x (1st operation)**	**x (1st operation)**	**x (1st operation)**
	2. Lever handle (or push pad)					**x**		**x**			
	3. Horizontal bar				**x**		**x**				
Operating (O)	0. None			**x**			**x**	**x**			**X**
	1. Lever handle (or push pad)		**x**			**x (with initiating)**				**X**	
	2. Horizontal bar	**x**			**x (with initiating)**				**X**		
Mechanical locking	0. None			**x**			**x**	**x**			**X**
	1. EN 179 Emergency exit device		**x**			**x**				**X**	
	2. EN 1125 Panic exit device	**x**			**x**				**X**		
Number of operation(s) (without time delay)	1. One operation			**x**	**x**	**x**	**x**	**x**			**x**
	2. Two operations	**x**	**x**						**x**	**x**	
Time delay	0. No time delay T0	**x**	**x**	**x**	**x**	**x**	**x**	**x**	**X**	**X**	**X**
	1. Single time delay t1	**x**	**x**	**x**	**x**	**x**	**x**	**x**	**X**	**X**	**X**

	2. Double time delay t2 (a)	**x**	**x**	**x**	**x**	**x**	**x**	**x**	**X**	**X**	**X**
Denied exit	0. None	**x**	**x**	**x**	**x**	**x**	**x**	**x**	**X**	**X**	**X**
	1. Yes (a)	**x**	**x**	**x**	**x**	**x**	**x**	**x**	**X**	**X**	**X**
Fire suitability (with electrical locking element not energised)	0. Not suitable (b)	**x**	**x**	**x**	**x**	**x**	**x**	**x**	**X**	**X**	**X**
	1. Suitable	**x**	**x**		**x**	**x**			**X**	**X**	
(a) CMC mandatory	(C) Controlling element	(L) Electrical locking element									
(b) Unless verified by specific tests	(I) Initiating element	(O) Operating element									

The suitability of a time delay and/or denied exit mode should be defined according to National regulations.

F.2Description of exit systems

The three following systems should be used:

a) One or more independent exit door in a building, see Figure F.1;

b) One or more independent exit door in a building connected e.g. to an alarm system, building management system and/or CCTV, see Figure F.2;

c) One or more door with double time delay and/or denied exit mode, controlled by CMC, see Figure F.3.

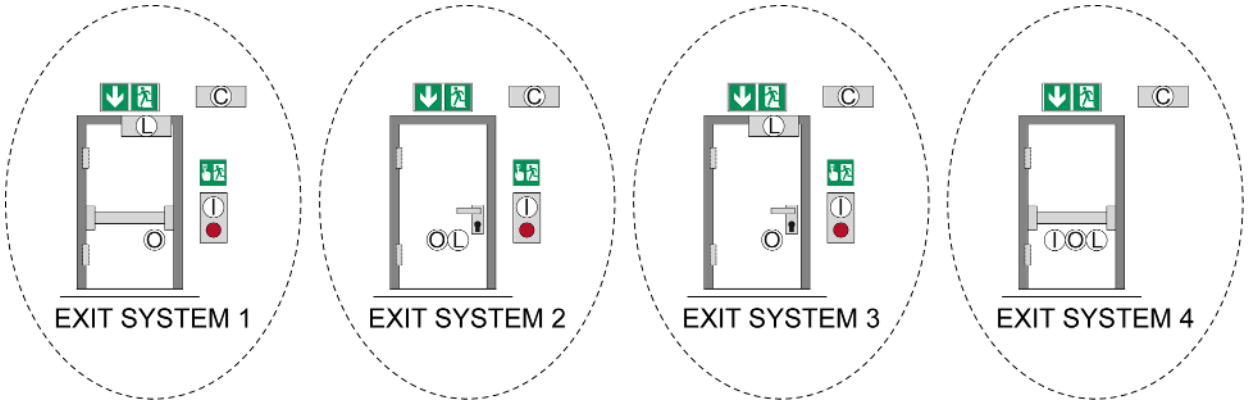


Figure F.1 — One or more independent exit door in a building

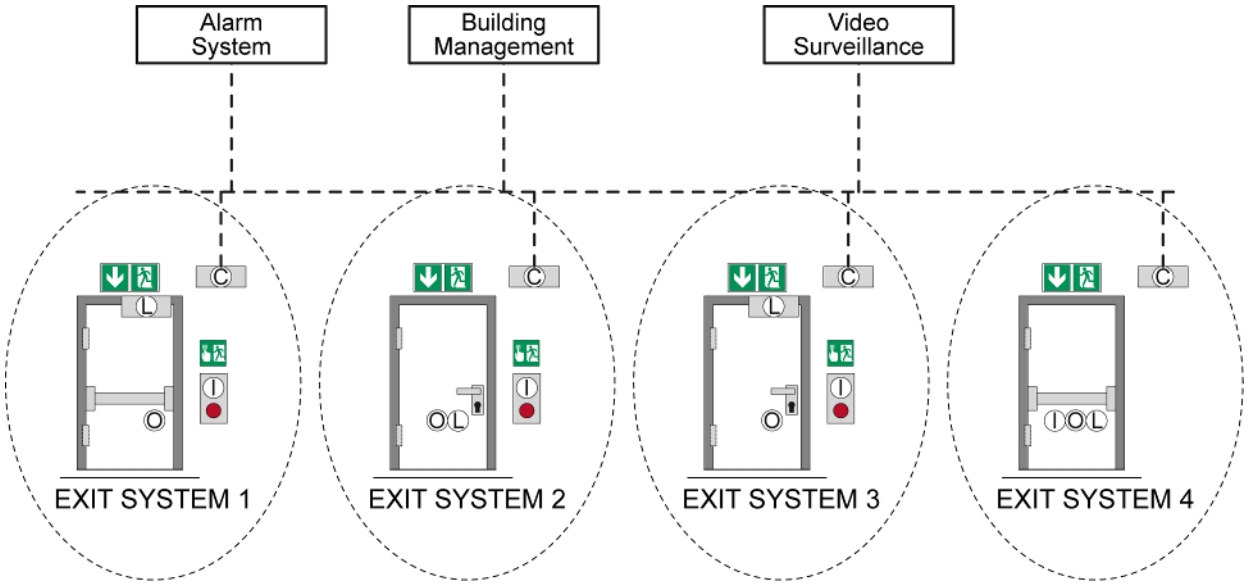


Figure F.2 — One or more independent exit door in a building connected

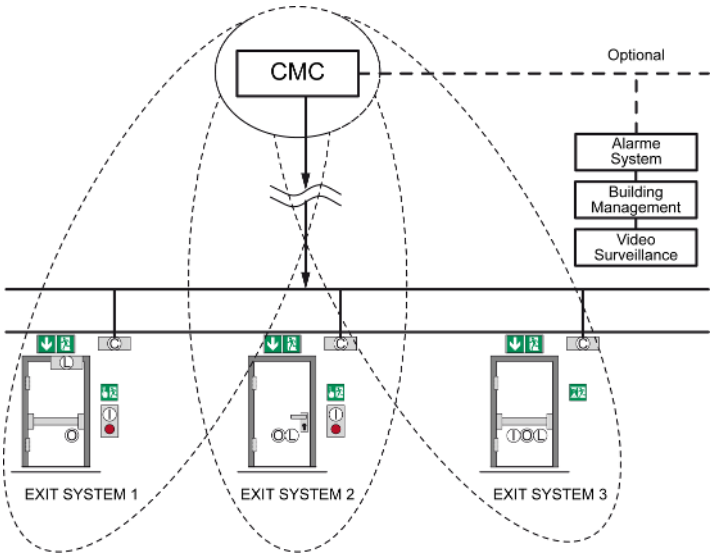


Figure F.3 — One or more door with double time delay and/or denied exit mode, controlled by CMC

F.3Door configurations

Each system could be installed with one of the door configurations described in Figure F.4.

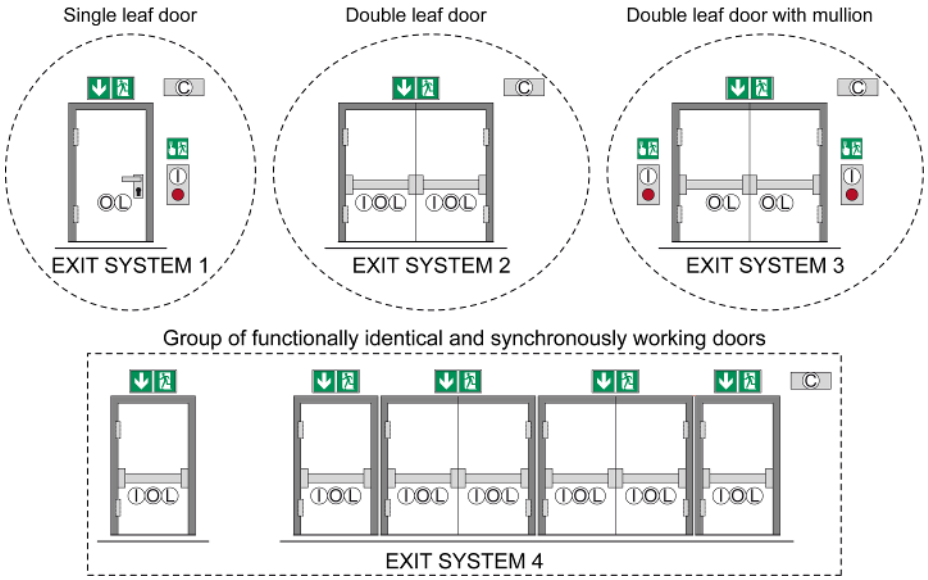


Figure F.4 — Door configurations

Annex ZA
(informative)

Clauses of this European Standard addressing the provisions of the EU Construction Products Regulation

ZA.1 Scope and relevant characteristics

This European Standard has been prepared under Mandate M/101 “External and internal doors and windows, roof openings and roof lights (including fire doors and shutters)” given to CEN by the European Commission and the European Free Trade Association.

If this European standard is cited in the Official Journal of the European Union (OJEU), the clauses of this standard, shown in this annex, are considered to meet the provisions of the relevant mandate, under the Regulation (EU) No. 305/2011.

REMINDER: Other requirements and other EU Directives can be applicable to the electrically controlled exit systems for use on escape routes falling within the scope of the European Standard.

NOTE 1 In addition to any specific clauses relating to dangerous substances contained in this standard, there may be other requirements applicable to the products falling within its scope (e.g. transposed European legislation and national laws, regulations and administrative provisions). In order to meet the provisions of the Regulation (EU) No.305/2011, these requirements need also to be complied with, when and where they apply.

NOTE 2 An informative database of European and national provisions on dangerous substances is available at the Construction website on EUROPA accessed through:

http://ec.europa.eu/growth/tools-databases/cp-ds/index_en.htm

This annex deals with the CE marking of the electrically controlled exit systems for use on escape routes intended for the uses indicated in Table ZA.1 and shows the relevant clauses applicable.

This annex has the same scope as in Clause 1 of this standard related to the aspects covered by the mandate and is defined by Table ZA.1.

Table ZA.1 — Relevant clauses for electrically controlled exit systems for doors on escape routes, on either fire or non-fire rated door assemblies

Product: Electrically controlled exit systems Intended use: for doors on escape routes, on either fire or non-fire rated door assemblies.			
Essential Characteristics	Clauses in this and other European Standard(s) related to essential characteristics	Regulatory classes	Notes
Ability to release (for doors on escape routes)	4.2		
- Number of operations to release	4.2.1		
- Operation of initiating element	4.2.2		
- Input signal from an alarm system	4.2.3		
- Resetting conditions	4.2.4		

- Operating element	4.2.5		
- Fail safe function and reliability of liaison and transmission paths	4.2.6		
- Release force – Door not under pressure	4.2.7		
- Release force – Door under pressure	4.2.8		
- Release from the initiating element	4.2.9		
- Release after power supply failure	4.2.10		
- Dimensional and design	4.2.11		
- Door mass and door dimensions	4.2.12		
- Keepers	4.2.13		
- Initiating element with cover	4.2.14		
- Finger trapping	4.2.15		
- Pictogram	4.2.16		
- Time delay	4.2.17		
- Central Management Control	4.2.18		
- Outside access device	4.2.19		
- Security	4.2.20		
Self-closing ability C (for fire/smoke doors)	4.3		
Suitability for use on fire and or smoke doors	4.4		
Control of Dangerous substances	4.5		
Durability of ability to release against aging and degradation	4.6		
- General	4.6.1		
- Abuse resistance of electrical locking element	4.6.2		
- Abuse resistance of initiating element	4.6.3		
- Abuse resistance of electrically lockable operating element	4.6.4		
- Environmental requirements – Temperature range	4.6.5		
- Environmental requirements – Corrosion resistance	4.6.6		
- Environmental requirements – Dry heat resistance	4.6.7		
- Environmental requirements – Cold resistance	4.6.8		
- Environmental requirements – Damp heat cyclic resistance	4.6.9		
- Environmental requirements – Impact	4.6.10		

resistance			
- Environmental requirements – Rated voltage	4.6.11		
- Electrical hazards safety (Low voltage)	4.6.12		
- EMC and/or R&TTE	4.6.13		
- IP protection against solid foreign objects and ingress of water and dust	4.6.14		
Durability of self-closing ability C against aging and degradation	4.7		

The declaration of the product performance related to certain essential characteristics is not required in those Member States (MS) where there are no regulatory requirements on these essential characteristics for the intended use of the product.

In this case, manufacturers placing their products on the market of these MS are not obliged to determine nor declare the performance of their products with regard to these essential characteristics and the option “No performance determined” (NPD) in the information accompanying the CE marking and in the declaration of performance (see ZA.3) may be used for those essential characteristics.

ZA.2 Procedure for AVCP of Electrically controlled exit systems

ZA.2.1 System of AVCP

The AVCP system(s) of Electrically controlled exit systems for use on escape routes indicated in Table ZA.1, established by EC Decision(s) is shown in Table ZA.2 for the indicated intended use(s) and relevant level(s) or class(es) of performance.

Table ZA.2 — System of AVCP

Product(s)	Intended use(s)	Level(s) or class(es) of performance	AVCP system(s)
Electrically controlled exit systems	for doors on escape routes, on either fire or non-fire rated door assemblies		1
System 1: See Regulation (EU) No. 305/2011 (CPR) Annex V, 1.2			

The AVCP of the electrically controlled exit systems for use on escape routes in Table ZA.1. shall be according to the AVCP procedures indicated in Table(s) ZA.3. resulting from application of the clauses of this or other European Standard indicated therein. The content of tasks of the notified body shall be limited to those essential characteristics as provided for, if any, in Annex III of the relevant mandate and to those that the manufacturer intends to declare.

Table ZA.3 — Assignment of AVCP tasks for Electrically controlled exit systems under system 1

Tasks		Content of the task	AVCP clauses to apply
Tasks for the manufacturer	Factory production control (FPC)	Parameters related to essential characteristics of Table ZA.1. relevant for the intended use which are declared	6.3
	Further testing of samples taken at factory according to the prescribed test plan	Essential characteristics of Table ZA.1. relevant for the intended use which are declared	6.3.2.5
Tasks for the notified product certification body	determination of the product type on the basis of type testing (including sampling), type calculation, tabulated values or descriptive documentation of the product	Essential characteristics of Table ZA.1. relevant for the intended use which are declared	6.2
	Initial inspection of manufacturing plant and of FPC	Parameters related to essential characteristics of Table ZA.1. relevant for the intended use which are declared. Documentation of the FPC.	6.3.4
	Continuous surveillance, assessment and evaluation of FPC	Parameters related to essential characteristics of Table ZA.1. relevant for the intended use which are declared. Documentation of FPC	6.3.5

ZA.2.2 Declaration of performance (DoP)

ZA.2.2.1 General

The manufacturer draws up the DoP and affixes the CE marking on the basis of the different AVCP systems set out in Annex V of the Regulation (EU) No 305/2011:

In case of products under system 1

- the factory production control and further testing of samples taken at the factory according to the prescribed test plan, carried out by the manufacturer; and

- the certificate of constancy of performance issued by the notified product certification body on the basis of determination of the product type on the basis of type testing (including sampling), type calculation, tabulated values or descriptive documentation of the product; initial inspection of the manufacturing plant and of factory production control and continuous surveillance, assessment and evaluation of factory production control.

ZA.2.2.2 Content

The model of the DoP is provided in Annex III of the Regulation (EU) No 305/2011.

According to this Regulation, the DoP shall contain, in particular, the following information:

- the reference of the product-type for which the declaration of performance has been drawn up;

- the AVCP system or systems of the construction product, as set out in Annex V of the CPR;

- the reference number and date of issue of the harmonized standard which has been used for the assessment of each essential characteristic;

- where applicable, the reference number of the Specific Technical Documentation used and the requirements with which the manufacturer claims the product complies.

The DoP shall in addition contain:

(a) the intended use or uses for the construction product, in accordance with the applicable harmonized technical specification;

(b) the list of essential characteristics, as determined in the harmonized technical specification for the declared intended use or uses;

(c) the performance of at least one of the essential characteristics of the construction product, relevant for the declared intended use or uses;

(d) where applicable, the performance of the construction product, by levels or classes, or in a description, if necessary based on a calculation in relation to its essential characteristics determined in accordance with the Commission determination regarding those essential characteristics for which the manufacturer shall declare the performance of the product when it is placed on the market or the Commission determination regarding threshold levels for the performance in relation to the essential characteristics to be declared.

(e) the performance of those essential characteristics of the construction product which are related to the intended use or uses, taking into consideration the provisions in relation to the intended use or uses where the manufacturer intends the product to be made available on the market;

(f) for the listed essential characteristics for which no performance is declared, the letters “NPD” (No Performance Determined);

Regarding the supply of the DoP, Article 7 of the Regulation (EU) No 305/2011 applies.

The information referred to in Article 31 or, as the case may be, in Article 33 of Regulation (EC) No 1907/2006, (REACH) shall be provided together with the DoP.

ZA.2.3 Example of DoP

The following gives an example of a filled-in DoP for an electrically controlled exit system

DECLARATION OF PERFORMANCE

Nber To be given by manufacturer

1. Unique identification code of the product-type:

To be given by manufacturer

2 Type, batch or serial number or any other element allowing identification of the construction product as required under Article 11(4):

To be given by manufacturer

3. Intended use or uses of the construction product, in accordance with the applicable harmonized technical specification, as foreseen by the manufacturer:

for doors on escape routes, on fire/smoke rated door assemblies

4. Name, registered trade name or registered trade mark and contact address of the manufacturer as required under Article 11(5):

AnyCo SA,

PO Box 21

B-1050 Brussels, Belgium

Tel. +32987654321

Fax: +32123456789

Email: anyco.sa@provider.be

5. Where applicable, name and contact address of the authorized representative whose mandate covers the tasks specified in Article 12(2):

Anyone Ltd

Flower Str. 24

West Hamfordshire

UK-589645 United Kingdom

Tel. +44987654321

Fax: +44123456789

e-mail: anyone.ltd@provider.uk

6. System or systems of assessment and verification of constancy of performance of the construction product as set out in CPR, Annex V:

System 1

7. In case of the declaration of performance concerning a construction product covered by a harmonized standard:

Notified product certification body No. 0123 performed the determination of the product type on the basis of type testing (including sampling), initial inspection of the manufacturing plant and of the factory production control and continuous surveillance, assessment and evaluation of factory production control and issued the certificate of constancy of performance of the product.

8. Declared performance

Essential characteristics	Performance	Harmonized technical specification
4.2 Ability to release (for doors on escape routes)		EN 13637:2015
4.2.1 - Number of operations to release	“releases in 2 single operations maximum” “operates correctly”	
4.2.2 - Operation of initiating element	“input signal ok”	
4.2.3 - Input signal from an alarm system	“resetting conditions ok”	
4.2.4 - Resetting conditions		
4.2.5 - Operating element	“Comply with EN 1125 or EN 179”	
4.2.6 - Fail safe function and reliability of liaison and transmission paths		
- 4.2.6.1 General	“fail safe”	
- 4.2.6.2 Software and hardware documentation	“Software and hardware documented”	
4.2.7 - Release force – Door not under pressure	“release not under pressure”	
4.2.8 - Release force – Door under pressure	“release under pressure”	
4.2.9 - Release from the initiating element	“release from the initiating element”	
4.2.10 - Release after power supply failure	“release after power supply failure”	
4.2.11 - Dimensional and design	“dimensions and design ok”	
4.2.12 - Door mass and door dimensions	“tested with a door width: x, height: y,mass: z”	
4.2.13 - Keepers	“Keepers ok”	
4.2.14 - Initiating element with cover	“Cover of initiating element ok”	
4.2.15 - Finger trapping	“Finger trapping test ok”	
4.2.16 - Pictogram	“Pictograms ok”	
4.2.17 - Time delay	“Grade x“	
4.2.18 - Central Management Control	“CMC ok“	
4.2.18.2.4 Denied exit mode	“Grade 0” or “Grade 1”	
4.2.18.2.5 Double time delay	“Grade 2”	
4.2.19 - Outside access device	“Outside acess device ok”	
4.2.20 - Security		
4.2.20.1 From outside	“Grade X”	
4.2.20.2 From inside	“Grade Y”	
4.3 Self-closing ability C (for fire/smoke doors)	“Grade X”	EN 13637:2015

4.4 Suitability for use on fire and or smoke doors	“Grade X”	
4.5 Control of Dangerous substances		
4.6 Durability of ability to release against aging and degradation		
4.6.1 - General	“Grade X"	
4.6.2 - Abuse resistance of electrical locking element	“withstand abuse force of 500N”	
4.6.3 - Abuse resistance of initiating element	“withstand abuse force of 500N”	
4.6.4 - Abuse resistance of electrically lockable operating element	“withstand abuse force of xxxN”	
4.6.5 - Environmental requirements – Temperature range	“tested between −10 and +55°C”	
4.6.6 - Environmental requirements – Corrosion resistance	“Grade X”	
4.6.7 - Environmental requirements – Dry heat resistance	“Dry Heat resistant”	
4.6.8 - Environmental requirements – Cold resistance	“Cold resistant”	
4.6.9 - Environmental requirements – Damp heat cyclic resistance	“Grade X”	
4.6.10 - Environmental requirements – Impact resistance	“Impact resistant”	
4.6.11 - Environmental requirements – Rated voltage	“Rated voltage checked”	
4.6.12 - Electrical hazards safety (Low voltage)	“Safe against electrical hazards”	
4.6.13 - EMC and/or R&TTE	“EMC and/or R&TTE compliant”	
4.6.14 - IP protection against solid foreign objects and ingress of water and dust	“Grade X”	

9. The performance of the product identified in points 1 and 2 is in conformity with the declared performance in point 8.

This declaration of performance is issued under the sole responsibility of the manufacturer identified in point 4.

Signed for and on behalf of the manufacturer by:

……

(name and function)

……..……..……

(place and date of issue) (signature)

ZA.3 CE marking and labelling

The CE marking symbol shall be in accordance with the general principles set out in Article 30 of Regulation (EC) No 765/2008 and shall be affixed visibly, legibly and indelibly

- to the Electrically controlled exit system.

or

- to a label attached to it

Where this is not possible or not warranted on account of the nature of the product, it shall be

affixed:

- to the packaging

or

- to the accompanying documents.

The CE marking shall be followed by:

- the last two digits of the year in which it was first affixed,

- the name and the registered address of the manufacturer, or the identifying mark allowing

- identification of the name and address of the manufacturer easily and without any ambiguity,

- the unique identification code of the product-type

- the reference number of the declaration of performance

- the level or class of the performance declared

- the dated reference to the harmonized technical specification applied, i.e EN 13637:2015

- the identification number of the notified body

- the intended use as laid down in the harmonized technical specification applied.

The CE marking shall be affixed before the construction product is placed on the market. It may be followed by a pictogram or any other mark notably indicating a special risk or use.

Regarding the supply of the DoP, article 7 of the Regulation (EU) No 305/2011 applies.

Figure ZA.1 give example of the information related to products subject to AVCP under each of the system to be given in the Product Information.

CE 0123	CE marking, consisting of the “CE”-symbol Identification number of the product certification body
AnyCo Ltd, PO Box 21, B-1050, Brussels, Belgium 15 Nber to be given by manufacturer	name and the registered address of the manufacturer, or identifying mark Last two digits of the year in which the marking was first affixed Reference number of the DoP
EN 13637:2015 Code to be given by the Manufacturer intended to be used on fire/smoke rated door assemblies for doors on escape routes	No. of European standard applied, as referenced in OJEU (see note 14) Unique identification code of the product-type Intended use of the product as laid down in the European standard applied Level or class of the performance declared

Ability to release (for doors on escape routes)	
Number of operations to release	“releases in 2 single operations maximum”
Operation of initiating element	“operates correctly”
Input signal from an alarm system	“input signal ok”
Resetting conditions	“resetting conditions ok”
Operating element	
Fail safe function and reliability of liaison and transmission paths	“Comply with EN 1125 or EN 179”
General	“fail safe”
Software and hardware documentation	“Sofware and hardware documented”
Release force – Door not under pressure	“release not under pressure”
Release force – Door under pressure	“release under pressure”
Release from the initiating element	“release from the initiating element”
Release after power supply failure	“release after power supply failure”
Dimensionnal and design	“dimensions and design ok”

Door mass and door dimensions	"tested with a door width: x, height: y,mass: z"
Keepers	"Keepers ok"
Initiating element with cover	"Cover of initiating element ok"
Finger trapping	"Finger trapping test ok"
Pictogram	"Pictograms ok"
Time delay	"Grade x"
Central Management Control	"CMC ok"
Denied exit mode	"Grade 0" or "Grade 1"
Double time delay	"Grade 2"
Outside access device	
Security	"Outside access device ok"
From outside	"Grade X"
From inside	"Grade Y"
Self-closing ability C (for fire/smoke doors)	"Grade X"
Suitability for use on fire and or smoke doors	"Grade X"
Control of Dangerous substances	
Durability of ability to release against aging and degradation	
General	"Grade X"
Abuse resistance of electrical locking element	"withstand abuse force of 500N"
Abuse resistance of initiating element	"withstand abuse force of 500N"
Abuse resistance of electrically lockable operating element	"withstand abuse force of xxxN"
Environmental requirements – Temperature range	"tested between -10 and +55°C"
Environmental requirements – Corrosion resistance	"Grade X"
Environmental requirements – Dry heat resistance	"Dry Heat resistant"
Environmental requirements – Cold resistance	"Cold resistant"

Environmental requirements – Damp heat cyclic resistance	“Grade X”
Environmental requirements – Impact resistance	“Impact resistant”
Environmental requirements – Rated voltage	“Rated voltage checked”
Electrical hazards safety (Low voltage)	“Safe against electrical hazards”
EMC and/or R&TTE	
IP protection against solid foreign objects and ingress of water and dust	“EMC and/or R&TTE compliant” “Grade X”

Figure ZA.1 — Example CE marking information of products under AVCP system 1 on the Product Information

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