



Technical Report

ISO/TR 8101-10

Fire safety on lifts —

Part 10:

Comparison of safety standards worldwide on lifts used by firefighters and for building evacuation

Sécurité incendie des ascenseurs —

*Partie 10: Comparaison des normes de sécurité sur le plan
mondial pour les ascenseurs utilisés par les pompiers et pour
l'évacuation des bâtiments*

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

ISO draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). ISO takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, ISO had not received notice of (a) patent(s) which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at www.iso.org/patents. ISO shall not be held responsible for identifying any or all such patent rights.

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 178, *Lifts, escalators and moving walks*.

This first edition of ISO/TR 8101-10 cancels and replaces ISO/TR 16765:2003, which has been technically revised. It also incorporates the Technical Corrigendum ISO/TR 16765:2003/Cor 1:2003.

The main changes are as follows:

- updated list of countries which responded to the questionnaire;
- completely updated list of questions included in the questionnaire as well as the appropriate responses.

A list of all parts in the ISO 8100 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

This document includes a comparison between CEN Standard EN 81-72 for firefighters' lifts (elevators) and the national codes of several countries which responded to a questionnaire circulated to TC 178 members. The questionnaire results include responses from the responding countries, including the information for EN 81-72 (which is used by twenty-eight EU countries, Iceland, Macedonia, Norway, Serbia, Switzerland and Turkey), plus individual responses from Australia, Austria, Canada, China, Denmark, Finland with two separate responses, Germany, India, Japan, Namibia, Netherlands, Norway, Russia, Switzerland, UK and USA. The goal was to prepare a technical report which provides reference information to assist national standards committees when reviewing and revising individual codes and which can initiate a gradual convergence of the technical requirements worldwide.

The comparison includes reference to national lift (elevator) codes, fire codes and building regulations.

This document is intended to aid standards writers in developing their firefighters lift (elevator) requirements and to help standards users understand the basis for the requirements as they are applied throughout the world.

Some information on evacuation procedures and issues is included in this document. Consideration of the evacuation information can be used in connection with the updating of existing ISO documents on this subject (e.g. ISO/TS 18870 and ISO/TR 25743).

This document can be read in conjunction with the various lift (elevator), fire and building codes, as it was often necessary to summarize the requirements for the sake of the comparisons. Further, the information contained in this document does not necessarily represent the opinions of the standards writing organization responsible for the developments of the safety standards which are being compared.

This document can be used as a basis together with an appropriate risk assessment when preparing a global standard for firefighters' lifts and/or evacuation lifts (elevators).

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Fire safety on lifts —

Part 10:

Comparison of safety standards worldwide on lifts used by firefighters and for building evacuation

1 Scope

This document consists of an updated comparison of the requirements of selected topics pertaining to the use of lifts for firefighting and building evacuation, as covered by worldwide safety standards.

This document applies to electric traction lifts only, although some sections are also applicable for positive drive lifts and other lifts suspended by rope or chain.

2 Normative references

There are no normative references in this document.

3 Terms and definitions and abbreviated terms

3.1 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

3.1.1

control room

room separate from the lift well, allowing bodily entry and containing the lift controller

3.1.2

control space

space inside the lift well containing the lift controller

3.1.3

evacuation

planned and orderly phased movements to withdraw, or cause to withdraw, users from a building via accessible routes to one or more accessible places of safety in the event of an emergency

[SOURCE: ISO 21542:2021, 3.10, modified — Fire evacuation shortened to more general term Evacuation. "All users" changed to "users".]

3.1.4

machinery space

space in the lift well containing the machine

3.1.5

Phase 1

priority recall for the firefighters' lift

Note 1 to entry: See EN 81-72-2020, 5.8.7.

3.1.6

Phase 2

use of the lift under firefighters' control

Note 1 to entry: See EN 81-72-2020, 5.8.8.

3.2 Abbreviated terms

FFL	firefighters' lift	See EN 81-72-2020, 3.5.
FSAL	fire service access level	See EN 81-72-2020, 3.8.

4 Questionnaire results

The countries that responded to the questionnaire are grouped in sections in [Annex A](#), in no particular order.

This document doesn't state requirements or suggest specific solutions. The results indicate different solutions for similar problems or issues which have been implemented in the various countries.

This document attempts to provide information on requirements on lifts used for firefighting and evacuation, particularly when performance-based building codes or building regulations are being applied.

Requirements listed in the tables are valid at the time of the questionnaire and might have been superseded or updated since that time. The requirements are a moving target and constantly evolving. Building and lift designers are expected to always check building codes or building regulations and the lift standard in effect before implementing a specific design. Lifts used as firefighters' lifts and emergency lifts are defined in the various applicable building codes or building regulations and lift standards. Users of this document should refer to the local standards for an understanding of the appropriate description, use and application of the various types of lifts.

Building evacuation concepts and requirements are being actively discussed or implemented in many countries and might have evolved beyond the requirements stated in this document. Users of this document are expected to always verify local requirements and discuss these requirements with the appropriate experts and authorities. See also ISO/TS 18870 and ISO/TR 25743

Annex A
(informative)

Comparison of fire codes and requirements — Sections of the comparison

A.1 [Table A.1](#)

[Table A.1](#) includes countries using EN 81-72 (which includes twenty-eight EU countries, Iceland, Macedonia, Serbia, and Turkey), Austria and Australia.

NOTE Australia has not adopted EN 81-72.

A.2 [Table A.2](#)

[Table A.2](#) includes Canada, United States and Japan.

A.3 [Table A.3](#)

[Table A.3](#) includes China and Finland. Two responses were received from Finland and both are included. One response was from lift experts and the other response was from firefighting experts in Finland.

A.4 [Table A.4](#)

[Table A.4](#) includes India, the United Kingdom and Germany.

A.5 [Table A.5](#)

<https://standards.iteh.ai/catalog/standards/iso/8b57b79d-a63b-4ae1-8028-f8a0033f94f4/iso-tr-8101-10-2024>
[Table A.5](#) includes Denmark, Russia and Namibia.

A.6 [Table A.6](#)

[Table A.6](#) includes Netherlands, Norway and Switzerland.

Table A.1 — Countries using EN 81-72

Number	Question	28 EU countries, Macedonia, Serbia, Turkey, Iceland, Norway and Switzerland		Australia		Austria	
		Answer	Code Reference	Answer	Code Reference	Answer	Code Reference
1.0	Building Requirements						
1.1 (a)	What building code is effective in your country?	Country specific		NCC 2019		Country specific	EN 1990:2013
1.1 (b)	Is a protected lobby in front of FFL required?	Yes. It is called as Safe Area.	EN 81-72:2020, 5.1.1	No		Yes. It is called as Safe Area.	EN 81-72:2020, 5.1.1
1.2	Is there a particular building type or minimum building height requirement for:						
(a)	Firefighters' Lift(s)?	Country specific		Yes — Building classifications 2-9c (excluding 9a): 25 m effective height minimum — Building classification 9a (health care), where patient care areas are not at level with direct access to road or open space: Any effective height	NCC2019 Clause E3.4(a)(i) &(ii)	Country specific	Yes, regulation and limits depending on the federal state.
(b)	Lift Evacuation Systems? – Brief Description	Country specific		No		Country specific	No
(c)	Stretcher Use?	Country specific		Yes In at least one emergency lift, or where an emergency lift is not required, in at least one passenger lift that serves any storey above 12 m	NCC2019 Clause E3.2(a)(i) &(ii)	Country specific	Yes, TRVB 150 S:2018
(d)	Is there any requirement for every landing in the building to be served by the Firefighters' Lift?	No. The floors to be served are assumed to be determined as part of the design of the building for fire.	EN 81-72:2020, 1.4 EN 81-72:2020, 5.1.1	Yes	NCC2019 Clause E3.4(b)	No. Country specific	EN 81-72:2020, 1.4 TRVB 150 S:2018
1.3	Is smoke control required in:						
(a)	liftwell?	No		No		Yes	TRVB 150 S:2018
(b)	lobby?	No		No		Yes	TRVB 150 S:2018

Table A.1 (continued)

Number	Country → Question	28 EU countries, Macedonia, Serbia, Turkey, Iceland, Norway and Switzerland		Australia		Austria	
		Answer	Code Reference	Answer	Code Reference	Answer	Code Reference
1.4	Does the building design reduce water flowing into lift well during a fire? If yes, is there:	Yes	EN 81-72:2020, 5.1.2 EN 81-72:2020, 5.3.4 EN 81-72:2020, Annex E.2	No		Yes	EN 81-72:2020, 1.2 EN 81-72:2020, 5.1.2 EN 81-72:2020, 5.3.4 EN 81-72:2020, Annex E.2
(a)	Protection from sprinklers?	Sprinklers are not permitted in firefighters lift well and machinery spaces	EN 81-72:2020, 5.2.9			Sprinklers are not permitted in firefighters lift well and machinery spaces	EN 81-72:2020, 5.2.9
(b)	Protection from FF hoses?	No				No	
1.5	Can lifts other than FFL be used for evacuation?	Yes, country specific	TS 81-76:2011 Evacuation of disabled persons using lifts ISO/TS 18870:2014 Lifts (elevators) — Requirements for lifts used to assist in building evacuation	Yes As a performance solution to DP7	NCC2019 DP7	Yes, but only in specific cases.	TS 81-76:2011 Evacuation of disabled persons using lifts
1.6	Can lifts with partial well enclosures be used as FFLs?	Yes, in combination with additional safety means	EN 81-72:2020, 1.3	No	NCC2019 Clause E3.4(d)(i)	No	EN 81-72:2020, 1.3
1.7	Can FFLs be part of a group of non-FFLs? If yes:	Yes		Yes	NCC2019 Clause E3.4(b),(c),(d)	Yes	
(a)	What are maximum number of lifts in one well?	Not specified, country specific.		No limit			
(b)	Must there be a solid dividing wall between FFL and rest of lifts in a common well?	Yes, country specific		No		Yes	TRVB 150 S:2018
1.9	What is the required ambient temperature range?						
(a)	In machine room?	0-40 °C Note: This temperature range is a requirement for the lift.	EN 81-72:2020, 5.2.5 b)	40 C		0-40 °C	EN 81-72:2020, 5.2.5 b)
(b)	In machinery space?	0-40 °C Note: This temperature range is a requirement for the lift.	EN 81-72:2020, 5.2.5 b)	40 C		0-40 °C	EN 81-72:2020, 5.2.5 b)

Table A.1 (continued)

Number	Country →	28 EU countries, Macedonia, Serbia, Turkey, Iceland, Norway and Switzerland		Australia		Austria		
		Question	Answer	Code Reference	Answer	Code Reference	Answer	Code Reference
(c)		In control room?	0-40 °C Note: This temperature range is a requirement for the lift.	EN 81-72:2020, 5.2.5 b)	40 C		0-40 °C	EN 81-72:2020, 5.2.5 b)
(d)		In control space?	0-40 °C Note: This temperature range is a requirement for the lift.	EN 81-72:2020, 5.2.5 b)	40 C		0-40 °C	EN 81-72:2020, 5.2.5 b)
(e)		In lift well	0-40 °C Note: This temperature range is a requirement for the lift.	EN 81-72:2020, 5.2.5 b)	For glass shafts with solar gain 5 C above ambient to a maximum of 45 C	NCC2019 Specification E3.1	0-40 °C	EN 81-72:2020, 5.2.5 b)
(f)		On lobby side of landing doors	Electrical/electronic lift devices shall be designed to function correctly at 0-65 °C or be made non-operational.	EN 81-72:2020, 5.2.5 a)			Devices shall be designed to operate correctly at 0-65 °C or be made non-operational.	EN 81-72:2020, 5.2.5 a)
1.10		What is the maximum time(s) for FFL to travel from fire service access level to top floor?	60 s. if travel height >200 m, permitted to add 1 s for each 3 m	EN 81-72:2020, 5.2.4	Not specified		60 s. if travel height >200 m, permitted to add 1 s for each 3 m	EN 81-72:2020, 5.2.4
1.11		Must a single FFL serve all floors of a building including those with sky lobbies?	No. The floors to be served are assumed to be determined as part of the design of the building for fire.	EN 81-72:2020, 1.4 EN 81-72:2020, 5.1.1	Yes, if more than one lift is used then transfer floor has to be fire isolated and smoke protected. More than one emergency lift may be used. "Emergency lifts must serve all floors in a building served by passenger lifts". "One emergency lift is not required to serve all floors in a building. Just as one bank of passenger lifts may serve certain floors, so may emergency lifts"	Guide to NCC Volume One 2019 Clause E3.4	No.	EN 81-72:2020, 1.4 TRVB 150 S:2018 EN 81-72:2020, 5.1.1
1.12		What fire test standard is used for lift landing doors?	EN 81-58 Fire classification of landing doors is defined by national building codes.	EN 81-72:2020, 5.1.2	AS1735 part 11 - 1986	NCC2019 C3.10	EN 81-58 Fire classification of landing doors is defined by national building codes.	EN 81-58
1.13		Do lift landing doors of FFLs have to be thermally insulated?	Not defined, depends on national regulations.	EN 81-72:2020, 5.1.2	No	NCC2019 C3.10	No	
1.14		What is minimum fire rating (minutes) of lift landing doors for FFLs?	Country specific.		60 minutes integrity (-/60/-)	NCC2019 C3.10	Country specific.	TRVB 150 S:2018 E90 (90 min)
1.15		Do the lift landing doors resist smoke penetration?	No		No		No	
1.16		Are liquid based sprinklers permitted?		EN 81-72:2020, 5.2.9		NCC2019 E1.5 AS2118.1-2017		

Table A.1 (continued)

Number	Country → Question	28 EU countries, Macedonia, Serbia, Turkey, Iceland, Norway and Switzerland		Australia		Austria	
		Answer	Code Reference	Answer	Code Reference	Answer	Code Reference
(a)	In the machine room	No		Yes		No	
(b)	In machinery spaces	No		Yes		No	
(c)	In control rooms	No		Yes		No	
(d)	In control spaces	No		Yes		No	
(e)	In the hoistway top	No		Yes		No	
(f)	In the lift lobby	Yes		Yes		Yes	
(g)	In the hoistway pit	No		Yes		No	
1.17	Are liquid based sprinklers required?				NCC2019 E1.5 AS2118.1-2017 Clause 5.9.2		
(a)	In the machine room	No		Sometimes		No	
(b)	In machinery spaces	No		Sometimes		No	
(c)	In control rooms	No		Sometimes		No	
(d)	In control spaces	No		Sometimes		No	
(e)	In the hoistway top	No		Sometimes		No	
(f)	In the lift lobby	No		Sometimes		No	
(g)	In the hoistway pit	No		Sometimes		No	
1.18	Are liquid based sprinklers prohibited?						
(a)	In the machine room	Yes		No		Yes	
(b)	In machinery spaces	Yes		No		Yes	
(c)	In control rooms	Yes		No		Yes	
(d)	In control spaces	Yes		No		Yes	
(e)	In the hoistway top	Yes		No		Yes	
(f)	In the lift lobby	No		No		No	
(g)	In the hoistway pit	Yes		No		Yes	
1.19	Is power to the lifts removed if sprinklers are activated in the machine room and/or hoistway?	Yes, according to EN 81-20 but EN 81-72 do not permit sprinklers in these spaces		NCC = NO, EN81-20 = YES		Sprinkler are prohibited	EN 81-20:2020, 5.2.1.2.1

Table A.1 (continued)

Number	Country → Question	28 EU countries, Macedonia, Serbia, Turkey, Iceland, Norway and Switzerland		Australia		Austria	
		Answer	Code Reference	Answer	Code Reference	Answer	Code Reference
1.20	Are there requirements to prevent water entering the hoistways of lifts used for evacuation?	Yes	EN 81-72:2020, 1.2 EN 81-72:2020, 5.1.2 EN 81-72:2020, 5.3.4 EN 81-72:2020, Annex E.2	No		Yes	EN 81-72:2020, 1.2 EN 81-72:2020, 5.1.2 EN 81-72:2020, 5.3.4 EN 81-72:2020, Annex E.2
(a)	If yes, how is the water protection implemented? Is it a building design requirement or a lift requirement?	Building design requirement.				Building design requirement.	Drain or pump
1.21	What is the maximum floor height in a blind hoistway?	7 m	EN 81-72:2020, 5.2.7	NCC = 12,2 m, EN81-20 = 11	NCC2019 Specification E3.1 Clause 6	7 m	EN 81-72:2020, 5.2.7
1.22	Can FF.Ls also be used for moving goods (freight)?	Yes	EN 81-20:2020, 1.1 EN 81-72:2020, Title of the standard	NO		Yes	EN 81-20:2020, 1.1 EN 81-72:2020, Title of the standard
(a)	As a single lift in a residential building?	Yes				Yes	
(b)	As part of a group installation?	Yes				Yes	
1.23	Are there any situations where Firefighter's Lifts or lifts used for evacuation are required to have machine room, i.e. they are not permitted to be MRL lifts?	No				No	
1.24	In the case of MRL lifts used as Firefighter's Lifts or for evacuation, are there specific requirements for devices used for rescue operations to be located at a specific location?	No		NO		No	
1.25	Is pressurization of the hoistways, stairways and lobbies required or permitted?	Permitted	EN 81-72:2020, 5.1.8	Lift wells and lobbies - Permitted as a performance solution Stairways – Required according to NCC2019 E2.2 Table E2.2a	AS1668.1-2015 Section 12 (lift wells) NCC2019 E2.2 Table E2.2a (stairways)	Permitted	