BS EN 81-77:2022

BSI Standards Publication

Safety rules for the construction and installations of lifts — Particular applications for passenger and goods passenger lifts

Part 77: Lifts subject to seismic conditions

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National foreword

This British Standard is the UK implementation of EN 81-77:2022. It supersedes BS EN 81-77:2018, which will be withdrawn on 31 May 2024.

The UK participation in its preparation was entrusted to Technical Committee MHE/4, Lifts, hoists and escalators.

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

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Date	Text affected

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EUROPEAN STANDARD

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Supersedes EN 81-77:2018

English Version

Safety rules for the construction and installations of lifts - Particular applications for passenger and goods passenger lifts - Part 77: Lifts subject to seismic conditions

Règles de sécurité pour la construction et l'installation des élévateurs - Applications particulières pour les ascenseurs et les ascenseurs de charge - Partie 77 : Ascenseurs soumis à des conditions sismiques

Sicherheitsregeln für die Konstruktion und den Einbau von Aufzügen - Besondere Anwendungen für Personen- und Lastenaufzüge - Teil 77: Aufzüge unter Erdbebenbedingungen

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European foreword

This document (EN 81-77:2022) has been prepared by Technical Committee CEN/TC 10 “Lifts, escalators and moving walks”, 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of an identical text or by endorsement, at the latest by November 2022, and conflicting national standards shall be withdrawn at the latest by May 2024.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 81-77:2018.

In comparison with the previous edition, the following significant changes have been made:

— update of normative references;

— visual indication of seismic mode;

— removal of Table 4 and reference to ISO 7465:2007;

— modification of Annex ZA.

No technical changes have been made in Clause 5 during this revision.

This document is intended to be used in conjunction with EN 81-20:2020, which gives the basic requirements for passenger and goods passenger lifts.

This document is part of the EN 81 series of standards. The structure of the EN 81 series is described in CEN/TR 81-10:2008.

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

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

Any feedback and questions on this document should be directed to the users’ national standards body. A complete listing of these bodies can be found on the CEN website.

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, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

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Introduction

0.1 General

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

This document is of relevance, in particular, for the following stakeholder groups representing the market players with regard to machinery safety:

— machine manufacturers (small, medium and large enterprises);

— health and safety bodies (regulators, accident prevention organizations, market surveillance, etc.).

Others can be affected by the level of machinery safety achieved with the means of the document by the above-mentioned stakeholder groups:

— machine users/employers (small, medium and large enterprises);

— machine users/employees (e.g. trade unions, organizations for people with special needs);

— service providers, e.g. for maintenance (small, medium and large enterprises);

— consumers (in case of machinery intended for use by consumers).

The above-mentioned stakeholder groups have been given the possibility to participate in the drafting process of this document.

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

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

0.2 Principles

Risk analysis, terminology and technical solutions have been considered taking into account the methods of EN ISO 12100:2010 and EN ISO 14798:2013.

0.3 Assumptions

It is assumed that information has been exchanged to determine the design acceleration (a_d) to be considered and the most effective position of the seismic detection system, if any, and of the primary wave detection system, if any.

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1 Scope

This document specifies the additional special provisions and safety rules for passenger and goods passenger lifts where these lifts are installed in buildings and constructions (hereinafter buildings) intended to withstand seismic events in compliance with EN 1998-1:2004 (Eurocode 8), during use, maintenance, inspection and emergency operation of lifts.

The aim of this document is to:

— avoid loss of life and reduce the extent of injuries;

— avoid people getting trapped in the lift;

— avoid damage;

— avoid environmental problems related to oil leakage;

— reduce the number of lifts out of service.

This document does not introduce any specific provisions and safety rules for lifts when $a_d \leq 1\ m/s^2$ as defined in Annex A.

This document does not address other risks due to seismic events (e.g. fire, flood, explosion).

This document is not applicable to lifts installed before the date of its publication.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 81-20:2020, *Safety rules for the construction and installation of lifts — Lifts for the transport of persons and goods — Part 20: Passenger and goods passenger lifts*

EN 81-72:2020, *Safety rules for the construction and installation of lifts — Particular applications for passenger and goods passenger lifts — Part 72: Firefighters lifts*

EN ISO 12100:2010, *Safety of machinery — General principles for design — Risk assessment and risk reduction (ISO 12100:2010)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN ISO 12100:2010, EN 81-20:2020 and the following 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/

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3.1
snag point
point of interference between flexible moving elements and fixed elements

Note 1 to entry: Examples of flexible moving elements are ropes, chains, travelling cable.

Note 2 to entry: Examples of fixed elements are guide rail brackets, guide rail clip bolts, fishplates, vanes, and similar devices.

3.2
design acceleration
a_d
horizontal acceleration used for calculation of forces acting on lift systems and arising from seismic events

Note 1 to entry: See Annex B.

3.3
seismic lift categories
categories in which lifts have been divided, taking into account the design acceleration (a_d)

Note 1 to entry: Table A.1 shows the seismic lift categories.

3.4
primary wave
compressional wave that is longitudinal in nature

Note 1 to entry: Earthquake advance warning is possible by detecting the non-destructive primary waves that travel more quickly through the Earth's crust than do the destructive secondary waves (shear wave that is transverse in nature, its motion being perpendicular to the direction of wave propagation). The amount of advance warning depends on the delay between the arrival of the primary wave and other destructive waves, generally in the order of seconds for distant, large quakes.

Note 2 to entry: Secondary waves move through solids, unlike surface waves. They are destructive and arrive later than primary waves.

3.5
seismic trigger level
seismic acceleration which activates a seismic detection system

3.6
seismic mode
special mode in which the lift operates after detection of seismic trigger level

3.7
seismic stand-by mode
special mode in which the lift operates after detection of primary wave without the activation of the seismic detection system

3.8
normal operation
operation mode in which the lift operates when not in seismic mode or in seismic stand-by mode

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