



BSI Standards Publication

# Safety rules for the construction and installation of lifts — Lifts for the transport of goods only

---

Part 31: Accessible goods only lifts

This is a preview of BS EN 81-31:2024. [Click here to purchase the full version from the ANSI store.](#)

## National foreword

This British Standard is the UK implementation of EN 81-31:2024. It supersedes BS EN 81-31:2010, which is withdrawn.

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.

This publication has been prepared under a mandate given to the European Standards Organizations by the European Commission and the European Free Trade Association. It is intended to support requirements of the EU legislation detailed in the European Foreword. A European Annex, usually Annex ZA or ZZ, describes how this publication relates to that EU legislation.

For the Great Britain market (England, Scotland and Wales), if UK Government has designated this publication for conformity with UKCA marking (or similar) legislation, it may contain an additional National Annex. Where such a National Annex exists, it shows the correlation between this publication and the relevant UK legislation. If there is no National Annex of this kind, the relevant Annex ZA or ZZ in the body of the European text will indicate the relationship to UK regulation applicable in Great Britain. References to EU legislation may need to be read in accordance with the UK designation and the applicable UK law. Further information on designated standards can be found at [www.bsigroup.com/standardsandregulation](http://www.bsigroup.com/standardsandregulation).

For the Northern Ireland market, UK law will continue to implement relevant EU law subject to periodic confirmation. Therefore Annex ZA/ZZ in the European text, and references to EU legislation, are still valid for this market.

UK Government is responsible for legislation. For information on legislation and policies relating to that legislation, consult the relevant pages of [www.gov.uk](http://www.gov.uk).

### Contractual and legal considerations

This publication has been prepared in good faith, however no representation, warranty, assurance or undertaking (express or implied) is or will be made, and no responsibility or liability is or will be accepted by BSI in relation to the adequacy, accuracy, completeness or reasonableness of this publication. All and any such responsibility and liability is expressly disclaimed to the full extent permitted by the law.

This publication is provided as is, and is to be used at the recipient's own risk.

The recipient is advised to consider seeking professional guidance with respect to its use of this publication.

This publication is not intended to constitute a contract. Users are responsible for its correct application.

© The British Standards Institution 2024  
Published by BSI Standards Limited 2024

ISBN 978 0 539 18208 8

This is a preview of BS EN 81-31:2024. [Click here to purchase the full version from the ANSI store.](#)

ICS 91.140.90

**Compliance with a British Standard cannot confer immunity from legal obligations.**

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 30 November 2024.

**Amendments/corrigenda issued since publication**

Date	Text affected
------	---------------

---

This is a preview of BS EN 81-31:2024. [Click here to purchase the full version from the ANSI store.](#)

This is a preview of BS EN 81-31:2024. [Click here to purchase the full version from the ANSI store.](#)

## EUROPÄISCHE NORM

November 2024

ICS 91.140.90

Supersedes EN 81-31:2010

English Version

## Safety rules for the construction and installation of lifts - Lifts for the transport of goods only - Part 31: Accessible goods only lifts

Règles de sécurité pour la construction et l'installation  
des élévateurs - Élévateurs pour le transport d'objets  
seulement - Partie 31 : Monte-charges accessibles

Sicherheitsregeln für die Konstruktion und den Einbau  
von Aufzügen - Aufzüge für den Gütertransport - Teil  
31: Betretbare Güteraufzüge

This European Standard was approved by CEN on 30 September 2024.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of 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, Türkiye and United Kingdom.



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

**CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels**

<b>Contents</b>	<b>Page</b>
European foreword.....	5
<b>0 Introduction .....</b>	<b>7</b>
<b>1 Scope .....</b>	<b>10</b>
<b>2 Normative references .....</b>	<b>11</b>
<b>3 Terms and definitions.....</b>	<b>14</b>
<b>4 Safety requirements and/or protective measures.....</b>	<b>20</b>
4.1 General .....	20
4.2 Well.....	20
4.2.1 General provision.....	20
4.2.2 Well enclosure .....	20
4.2.3 Access doors – access trapdoors .....	21
4.2.4 Shapes and clearances of the walls of well and landing doors facing carrier entrance(s).....	21
4.2.5 Protection of any spaces located below the well.....	22
4.2.6 Protection in the well.....	22
4.2.7 Headroom and pit.....	23
4.2.8 Exclusive use of the well, machine and pulley rooms .....	26
4.2.9 Lighting of the well and machinery spaces .....	27
4.2.10 Alarm device.....	27
4.2.11 Equipment in the pit.....	27
4.3 Machinery spaces .....	28
4.3.1 General provisions.....	28
4.3.2 Access.....	29
4.4 Landing doors .....	31
4.4.1 Openings.....	31
4.4.2 Height, width, sills of entrances at landings .....	31
4.4.3 Doors.....	32
4.4.4 Locked and closed landing door check.....	35
4.4.5 Locking and emergency unlocking.....	35
4.4.6 Electric safety device for proving the landing doors closed .....	38
4.5 Carrier, counterweight and balancing weight .....	38
4.5.1 Carrier .....	38
4.5.2 Counterweight and balancing weight.....	43
4.5.3 Protection for traction sheaves, pulleys and sprockets .....	43
4.5.4 Protection of machinery .....	45
4.6 Suspension, unintended carrier movement and excessive speed protection.....	45
4.6.1 Suspension means .....	45
4.6.2 Protections against free fall, excessive speed, unintended carrier movement and creeping of the carrier .....	47
4.7 Guiding systems, mechanical stops and final limit switches .....	56
4.7.1 General provision concerning guiding system .....	56
4.7.2 Guiding of the carrier, counterweight or balancing weight.....	57
4.7.3 Loads, stresses and deflections .....	57
4.7.4 Fixed stops and buffers .....	58
4.7.5 Final limit switches .....	59

This is a preview of BS EN 81-31:2024. [Click here to purchase the full version from the ANSI store.](#)

<b>4.8</b>	<b>Lift machine and associated equipment</b> .....	<b>60</b>
<b>4.8.1</b>	<b>General provisions</b> .....	<b>60</b>
<b>4.8.2</b>	<b>Lift machines for traction and positive drive</b> .....	<b>60</b>
<b>4.8.3</b>	<b>Lift machine for hydraulic drive</b> .....	<b>65</b>
<b>4.9</b>	<b>Electric installations and appliances</b> .....	<b>75</b>
<b>4.9.1</b>	<b>General provision</b> .....	<b>75</b>
<b>4.9.2</b>	<b>Contactors, contactor relays, components of safety circuits</b> .....	<b>76</b>
<b>4.9.3</b>	<b>Protection of electrical equipment</b> .....	<b>77</b>
<b>4.9.4</b>	<b>Main switches</b> .....	<b>77</b>
<b>4.9.5</b>	<b>Electric wiring</b> .....	<b>78</b>
<b>4.10</b>	<b>Protection against electric faults; failure analysis; controls; priorities</b> .....	<b>80</b>
<b>4.10.1</b>	<b>Failure analysis and electric safety devices</b> .....	<b>80</b>
<b>4.10.2</b>	<b>Controls; priorities</b> .....	<b>85</b>
<b>5</b>	<b>Verification of the safety requirements and/or protective measures</b> .....	<b>89</b>
<b>5.1</b>	<b>Verification and tests</b> .....	<b>89</b>
<b>5.2</b>	<b>Verification of design</b> .....	<b>90</b>
<b>5.3</b>	<b>Verification tests before putting into use</b> .....	<b>107</b>
<b>6</b>	<b>Information for use</b> .....	<b>107</b>
<b>6.1</b>	<b>General</b> .....	<b>107</b>
<b>6.2</b>	<b>Notices, markings and operating instructions</b> .....	<b>107</b>
<b>6.2.1</b>	<b>General provisions</b> .....	<b>107</b>
<b>6.2.2</b>	<b>Rating plate</b> .....	<b>107</b>
<b>6.2.3</b>	<b>Carrier</b> .....	<b>108</b>
<b>6.2.4</b>	<b>Landings</b> .....	<b>108</b>
<b>6.2.5</b>	<b>Machinery spaces</b> .....	<b>108</b>
<b>6.2.6</b>	<b>Well</b> .....	<b>109</b>
<b>6.2.7</b>	<b>Safety components</b> .....	<b>109</b>
<b>6.2.8</b>	<b>Electrical identification</b> .....	<b>110</b>
<b>6.2.9</b>	<b>Alarm device</b> .....	<b>110</b>
<b>6.2.10</b>	<b>More than one lifts in one machine room</b> .....	<b>110</b>
<b>6.2.11</b>	<b>Emergency lowering valve</b> .....	<b>110</b>
<b>6.2.12</b>	<b>Hand pump</b> .....	<b>110</b>
<b>6.2.13</b>	<b>Reduced headroom clearances</b> .....	<b>110</b>
<b>6.2.14</b>	<b>Reduced clearances in the pit</b> .....	<b>111</b>
<b>6.3</b>	<b>Instruction handbook</b> .....	<b>112</b>
<b>6.3.1</b>	<b>General</b> .....	<b>112</b>
<b>6.3.2</b>	<b>Minimum contents of the instruction handbook</b> .....	<b>112</b>
<b>6.3.3</b>	<b>Verifications and tests</b> .....	<b>117</b>
<b>6.3.4</b>	<b>Verifications and tests after accidents</b> .....	<b>117</b>
<b>6.4</b>	<b>Logbook</b> .....	<b>117</b>
	<b>Annex A (normative) List of electric safety devices</b> .....	<b>119</b>
	<b>Annex B (informative) Technical documentation</b> .....	<b>121</b>
<b>B.1</b>	<b>General</b> .....	<b>121</b>
<b>B.2</b>	<b>Technical details and plans</b> .....	<b>121</b>
<b>B.3</b>	<b>Electric diagrams and hydraulic diagrams</b> .....	<b>122</b>
	<b>Annex C (normative) Verifications and tests before putting into use</b> .....	<b>123</b>
<b>C.1</b>	<b>General</b> .....	<b>123</b>
<b>C.2</b>	<b>Tests and verifications</b> .....	<b>123</b>

This is a preview of BS EN 81-31:2024. [Click here](#) to purchase the full version from the ANSI store.

C.3	Tests and verifications in case of reduced clearances in pit and/or headroom.....	127
<b>Annex D (informative) Periodical verifications and tests, verifications and tests after an accident.....</b>		
D.1	Periodical verifications and tests .....	129
D.2	Verifications and tests after an accident.....	129
<b>Annex E (normative) Safety components and safety devices – Test procedures for verification.....</b>		
E.1	General provisions.....	130
E.2	Landing door locking devices.....	131
E.3	Safety gear .....	135
E.4	Overspeed governor .....	141
E.5	Safety circuits containing electronic components.....	143
E.6	Rupture valve/one-way restrictor .....	146
E.7	Buffers .....	150
E.8	Pre-triggered stopping system .....	153
<b>Annex F (informative) Construction of walls of accessible goods only lift well and landing doors facing a carrier entrance .....</b>		
<b>Annex G (normative) Calculations of rams, cylinders, rigid pipes and fittings .....</b>		
G.1	Calculations against over pressure .....	158
G.2	Calculations of the jacks against buckling.....	159
<b>Annex H (informative) Information to the user/owner of an accessible goods only lift.....</b>		
H.1	General .....	164
H.2	Means of access to machinery space entrance of the accessible goods only lift.....	164
H.3	Maintenance work carried out from a step of a ladder .....	164
<b>Annex I (normative) Electronic components – Failure exclusion.....</b>		
<b>Annex J (normative) Headroom and pit.....</b>		
J.1	General .....	172
J.2	Reduced clearances in the headroom .....	172
J.3	Reduced clearances in the pit .....	177
<b>Annex K (informative) Building interfaces .....</b>		
K.1	General provisions.....	182
K.2	Support of guide rails.....	184
K.3	Ventilation of well and machinery spaces.....	184
<b>Annex L (informative) List of significant hazards .....</b>		
<b>Annex ZA (informative) Relationship between this European Standard and the essential requirements of Directive 2006/42/EC aimed to be covered.....</b>		
<b>Bibliography.....</b>		
		195

This is a preview of BS EN 81-31:2024. [Click here to purchase the full version from the ANSI store.](#)

## European foreword

This document (EN 81-31:2024) 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 May 2025 and conflicting national standards shall be withdrawn at the latest by November 2026.

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 81-31:2010.

The main changes with respect to the previous edition EN 81-31:2010 are listed below:

- Requirements have been updated, taking into account EN 81-20:2020, EN 81-50:2020 and EN 81-21:2022. Specifically: definitions; strength of the doors, screens, partitions; unintended carrier movement; refuge spaces; inspection operation; rope's retainers; balustrade; lighting.
- The scope has been amended. Specifically: excluded overlapping with EN 1570, by use of rigid guide rails only; excluded scissor lifts; removed travel limit for Type A; non-addressed energy dissipation type buffers.
- Requirements and verifications have been added for: refuge spaces; clamping devices; pawl devices; automatic power operated doors; progressive safety gears.
- Improvements have been made for: dimensions of working areas; electrical equipment; emergency electrical operation; performance levels; ropes and terminations; existing buildings; impact factors; buffer with non-linear characteristics; alarm system.
- The reported errors have been eliminated. Specifically: hydraulic formulae;
- The text has been clarified. Specifically: pulley room; extreme position of the carrier in the well; use in limited / not limited access area; ingress in / egress from the well;
- The references to other standards have been updated, according to the progress in that field. All normatively referenced standards now are dated;
- Wording has been amended. Specifically: from “uncontrolled movement” to “unintended movement”; from “manual operation” to “emergency operation”; from “safety space” to “refuge space”; from “load carrying unit” to “carrier”; from “vendor” to “manufacturer”; from “laboratory” to “examiner”;
- The informative Annex “List of significant hazards” has been added;
- The informative Annex “Building interface” has been added;
- Annex ZA has been updated with regard to the European Commission mandate M/396.

This document has been prepared under a standardization request addressed to CEN by the European Commission. The Standing Committee of the EFTA States subsequently approves these requests for its Member States.

This is a preview of BS EN 81-31:2024. [Click here to purchase the full version from the ANSI store.](#)

For the relationship with EU Legislation, see informative Annex ZA, which is an integral part of this document.

This document is part of the EN 81 series of standards “Safety rules for the construction and installation of lifts”. This is the second edition.

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 organizations 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, Türkiye and the United Kingdom.

This is a preview of BS EN 81-31:2024. [Click here to purchase the full version from the ANSI store.](#)

## 0 Introduction

### 0.1 General

This document is a type-C standard as stated in EN ISO 12100:2010.

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 accessible goods only lift installation concerned and the extent to which hazards, hazardous situations and events are covered are indicated in the scope of this document.

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

### 0.2 General provision

**0.2.1** The object of this document is to define safety rules related to the construction and installation of accessible goods only lifts, with a view to safeguarding persons and objects against the risk of accidents associated with the use, inspection, maintenance and emergency operation of accessible goods only lifts.<sup>1</sup>

a) Persons to be safeguarded:

- 1) users;
- 2) maintenance and inspection personnel;
- 3) persons at the landings of the accessible goods only lift and in the machinery space(s) and pulley room(s), if any.

---

<sup>1</sup> Within CEN/TC 10 an interpretation committee has been established to answer questions about the spirit in which the experts have drafted the various clauses of this standard. All such interpretations are published within CEN/TS 81-11:2011 until incorporated by amendment into the standards concerned.

This is a preview of BS EN 81-31:2024. [Click here to purchase the full version from the ANSI store.](#)

b) Property to be safeguarded:

- 1) loads in carrier;
- 2) components of the accessible goods only lift installation;
- 3) building in which the accessible goods only lift is installed.

**0.2.2** A study has been made of the various possible hazards concerning accessible goods only lifts, see Annex L.

### **0.3 Principles used**

**0.3.1** This document does not repeat all the general technical rules applicable to every electrical, mechanical, or building construction including the protection of building elements against fire.

It has, however, seemed necessary to establish certain requirements of good construction, either because they are peculiar to accessible goods only lifts manufacture or because in the case of accessible goods only lifts utilization the requirements may be more stringent than elsewhere.

**0.3.2** As far as possible this document sets out only the requirements that materials and equipment have to meet in the interests of safe operation of accessible goods only lifts.

**0.3.3** This document considers a building that has characteristics in accordance with Annex K.

### **0.4 Assumption**

**0.4.1** Relevant risks have been considered for each component that may be incorporated in a complete accessible goods only lift installation.

Rules have been drawn up accordingly.

Components are:

- a) designed in accordance with usual engineering practice and calculation codes, taking into account all failure modes;
- b) of sound mechanical and electrical construction;
- c) made of materials with adequate strength and of sound quality;
- d) free of defects;
- e) free from harmful materials, e.g. asbestos.

**0.4.2** Components are selected and installed so that foreseeable environmental influences and special working conditions do not affect the safe operation of the accessible goods only lift.

**0.4.3** Users have to be safeguarded against their own negligence and unwitting carelessness when using the accessible goods only lift in the intended way.

**0.4.4** The accessible goods only lifts are not intended to transport persons inside the carrier.

**0.4.5** With the exception of the items listed below, a mechanical device built according to good practice and the requirements of this document will not deteriorate to a point of creating hazard without the

This is a preview of BS EN 81-31:2024. [Click here to purchase the full version from the ANSI store.](#)

possibility of detection, provided that all of the instructions given by the manufacturer have been duly applied.

The following mechanical failures are considered:

- a) breakage of the suspension;
- b) uncontrolled slipping of the ropes on the traction sheave;
- c) breakage and slackening of all linkage by auxiliary ropes, chains and belts;
- d) failure of one of the mechanical components of the machine brake which takes part in the application of the braking action on the drum or disk;
- e) failure of a component associated with the main drive elements and the traction sheave;
- f) rupture in the hydraulic system (jack excluded);
- g) small leakage in the hydraulic system (jack included).

**0.4.6** The possibility of devices providing protection against free fall or descent with excessive speed not engaging, should the carrier free fall from a stationary position at the lowest landing, before the carrier strikes the buffer(s) or fixed stop(s) is considered acceptable.

**0.4.7** When the speed of the carrier is linked to the electrical frequency of the mains, the speed is assumed not to exceed 115 % of the rated speed or a corresponding lower speed where specified in this document for inspection operation, re-levelling, emergency operation.

**0.4.8** The location of the accessible goods only lift to be such that users using the accessible goods only lift have means available to them, to access the different landing levels served, either a staircase or a means for the transportation of persons.

This is a preview of BS EN 81-31:2024. [Click here to purchase the full version from the ANSI store.](#)

## 1 Scope

**1.1** This document specifies the safety rules for new accessible goods only lifts with traction, positive or hydraulic drive, permanently installed and only used by users (see 3.57), serving fixed and permanent landing levels, having a carrier made of a single load carrying area, designed for the transportation of goods only, moving along a fixed path by rigid guide rails and inclined not more than 15° to the vertical, with rated speed not exceeding 1 m/s.

This document covers accessible goods only lifts with rated load exceeding 300 kg and not intended to transport persons.

**1.2** For the purpose of this document, a goods only lift carrier is regarded as accessible where one of the following conditions is satisfied:

- a) floor area of the carrier is greater than 1,0 m<sup>2</sup>;
- b) depth of the carrier is greater than 1,0 m;
- c) clear height of the carrier is greater than 1,20 m.

In case the carrier is without a roof, it is considered accessible when the clear height of the landing doors is greater than 1,20 m.

**1.3** Two types of accessible goods only lifts are addressed:

- a) Type A, where the intended use is bound to the maximum rated speed of 0,30 m/s;
- b) Type B, where the intended use is bound to the maximum rated speed of 1,0 m/s.

**1.4** In addition to the requirements of this document, supplementary requirements are to be considered in special cases (operation subject to ATEX rules, operational in environmental conditions not addressed by this standard, seismic conditions, transporting dangerous goods, etc.).

**1.5** This document does not cover:

- a) accessible goods only lifts:
  - 1) with more than one lift machine;
  - 2) where loading and unloading is automated, or the carrier floor is fitted with mobile devices (e.g. rollers) for loading and unloading purposes;
  - 3) intended to carry bulk loads (such as loose sand, gravel, etc.);
  - 4) with drive systems other than those stated in 4.8;
- b) lifting tables according to EN 1570-1 and EN 1570-2;
- c) lifting appliances, such as appliances with more than one carrier, skips, goods only lifts for construction sites, for underground applications, mine winding gear, goods only lifts on seagoing vessels and mobile offshore units, construction and maintenance appliances in wind turbines, goods only lifts specially designed and constructed for research purposes for temporary use in laboratories, goods only lifts specially designed and constructed for military or police purposes;
- d) safety during operation of transport, erection, repairs and dismantling of accessible goods only lifts;