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BSI Standards Publication

Safety rules for the construction and installation of lifts — Basics and interpretations

Part 12: Use of EN 81-20 and EN 81-50 in specific markets

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National foreword

This Published Document is the UK implementation of CEN/TR 81-12:2014.

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 secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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Règles de sécurité pour la construction et l'installation des élévateurs - Fondamentaux et interprétations - Partie 12: Utilisation des normes EN 81-20 et EN 81-50 dans les marchés spécifiques

Sicherheitsregeln für die Konstruktion und den Einbau von Aufzügen - Grundlagen und Auslegungen - Teil 12: Anwendung der EN 81-20 und EN 81-50 in bestimmten Märkten

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Foreword

This document (CEN/TR 81-12:2014) has been prepared by Technical Committee CEN/TC 10 “Lifts, escalators and moving walks”, the secretariat of which is held by AFNOR.

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

Introduction

EN 81-20 and EN 81-50 or their technical requirements are widely used not only in Europe [1)] and neighbouring countries but also in many regions and countries around the world. It is recognized that each region or country has its own legislative framework and practices that may influence the implementation of those standards or requirements.

This document has been developed in order to facilitate and encourage continued widespread use of EN 81-20 and EN 81-50 as a whole or their technical requirements. This document also provides guidance for use and implementation of those standards in the countries outside Europe while pointing out main issues in a specific region or a country.

1) For the purpose of this document, Europe is considered as CEN member countries: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, The Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, The Former Yugoslav Republic of Macedonia, Turkey and United Kingdom

1 Scope

This Technical Report gives guidance to users, primarily those outside Europe, in order to enable them to apply EN 81-20 and EN 81-50 so far as is reasonably practical, while recognizing specific socio-economic needs or national legislation in their country.

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 81-20:2014, *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 81-50:2014, *Safety rules for the construction and installation of lifts - Examinations and tests - Part 50: Design rules, calculations, examinations and tests of lift components*

3 Terms and definitions

For the purposes of this document, the terms and definitions found in EN 81-20 and EN 81-50 apply.

4 List of significant hazards

For the purposes of this document, the list of significant hazards found in EN 81-20 and EN 81-50 are applicable.

5 Guidance for the use of EN 81-20 and EN 81-50

5.1 Use of the words “shall”, “should”, “may” and “can”

“shall” is used to express a requirement of a standard. If compliance with the standard is claimed, compliance with all the expressions with “shall” is required.

EXAMPLE 1 “All assignments shall be documented.”

“should” is used to express recommendations.

EXAMPLE 2 “Care should be taken after preparation to prevent contamination. If contamination occurs […]”

“may” in a standard indicates that the standard is giving permission.

EXAMPLE 3 “One connection may have many channels.”

“can” describes a possibility.

EXAMPLE 4 “This product can be subjected to external climatic conditions.”

5.2 Importance of notes and annexes

A “note” within a CEN standard is not a technical requirement but advice given by the committee responsible for producing the standard with the intention of making the point clearer to understand.

“Informative annexes” are also considered as guidance and while they may contain specific measurable values such as dimensions, light and noise levels, these are still only advisory and therefore cannot be demanded to be respected for compliance to the standard.

Where an annex is stated to be “Normative”, its content is part of the relevant requirements stated in the core of the standard. If compliance with the standard is claimed, compliance with the annex is required.

Notes and informative annexes are often connected to either National Regulations with regard to how the standard is adopted or to the negotiations which should be carried out between the lift supplier and the person placing the order for the equipment.

5.3 Importance of assumptions

EN 81-20 is intended for use by technical professionals that have a general knowledge of lift technology. As it is not possible to describe all possible aspects and circumstances of how the standard may be used, the assumptions define the environment and the boundaries for application of the standard.

An assumption defines, up to a certain degree, the foundation of the standard and how assumptions shall be considered when applying the standard. However, they are not requirements of the standard and as such the compliance with those assumptions is not required.

5.4 Negotiations

5.4.1 General

EN 81-20 assumes the party supplying the lift and the party responsible for the end use of the lift take part in negotiations to ensure that the supplied product is fit for purpose and used in the intended manner.

These negotiations would normally include such items as the use of the lift as a passenger or goods/passenger lift, the means of loading, the goods to be carried, etc.

5.4.2 Car use and loading conditions

EN 81-20 gives three basic usage conditions to be reflected when designing the car frame, sill and guides;

- Passenger use = 40 % of the rated load applied to the car door sill;
- Goods/Passenger use = 60 % of the rated load applied to the car door sill;
- Heavy Goods use = 85 % of the rated load applied to the car door sill.

In some countries outside Europe it is more common for the lift owner to specify the intended use according to predetermined loading classifications, e.g. those given in the ASME A17.1/CSA B44 standard.

However in some regions outside Europe these are more commonly known by other descriptions such as:

- Class 1 - Passenger and general goods loading: applies when the load is distributed, the mass of any single piece of goods or any single hand truck and its load is not greater than 25 % of the rated load of the lift and the load is handled on and off the car platform manually or by means of hand trucks;

— Class 2 - Heavy goods loading: applies to heavy goods loading exceeding class 1, power or hand trucks are used for carrying the load in transit or for loading/unloading or for concentrated loads;

However, great care should be taken when using such classifications as they can be specific to the region such as those previously used in Europe for the design of guide rails etc. Examples are as follows:

— Class A – Passenger and general goods loading;

— Class B – Motor vehicle loading;

— Class C – Heavy goods loading.

The purpose of these designations is to ensure the designer and manufacturer are fully aware of the conditions under which the lift will be used and adapt their designs appropriately to ensure a satisfactory robustness and service life.

Therefore regardless of the actual descriptors of these usage conditions is it vital that adequate negotiations take place between the supplier and purchaser to ensure that the delivered product is suitable for its intended use.

5.5 Environmental Considerations

Some countries have specific requirements with regard to machinery space and lift well heating and ventilation due to their climate.

At present the normal operating temperature limits are specified in the assumptions EN 81-20 as +5° C to +40° C (degrees Celsius) as part of normal operational conditions. This is both as a means of equipment protection and as a limit to the working environment for lift personnel (see IEC 60364-5-51, Code AA5). EN 81-50 requires specific environmental conditions to be considered (e.g. exposure to UV and humidity for polyurethane buffers).

Some countries may have higher or lower ambient temperatures, altitude and other environmental considerations which may or may not affect the equipment, or to which the lift personnel have become acclimatised, or parameters which are specified by National Regulation.

Such situations should form part of the negotiations between supplier of the lift and purchaser.

5.6 Rationales for different loading conditions

EN 81-20 refers to several loading conditions:

100 % of the rated load: indicating fully loaded car under normal running conditions

110 % of the rated load: maximum loading before the overload sensor is activated, the lift being kept stationary at the floor level. This is to prevent that lift from moving under the overload conditions.

125 % of the rated loading: maximum overloading that may occur and causing lift movement under overload conditions. Relevant lift components such as machine brakes and safety gear to be capable of stopping the moving lift with specified deceleration rate or keeping the speed of the lift within a specified margin.

For hydraulic and positive drive, safety gear may be tested with 100 % of rated load.

As the design of the lift is based on the worst case scenario, i.e. 125 % overload, there is no need to consider lower overload situations in the calculations. The lift is then subjected to various tests on site at rated speed with loads of up to 125 % in order to verify the design and installation. See EN 81-20:2014, 6.3.

5.7 Good engineering practice

Good engineering practice is essential to ensure the safety of lift equipment. It should take into account all service conditions and failure modes. It should embrace the expectations and considerations to be taken into account for design of a lift component. Below are some relevant factors:

a) for every calculation of a design all probable load cases need to be defined and several assumptions should be made specific to the issue under consideration;

b) these assumptions should be based on commonly understood technical and engineering theory and practice and on the experience of the experts responsible for the design. For example, the dynamic factor in the case of counterweight jump when the empty car is stopped by the safety gear, the frictional forces imparted on the guide brackets in case of safety gear application through guide clips or the support of driving machines on structural steel members according to deflection criteria, etc.;

c) the load spectrum and frequencies of different loads should be defined. From this it should be decided which lead to endurance/fatigue stresses and which are occasionally applied loads which lead to corresponding stresses;

d) tolerances of parts, friction factors and possible variations during assembly need to be considered, e.g. tightening torque of fasteners to be defined;

e) the probability of a combination of worst cases of all influences should be described, considering that the simple combination of all worst assumptions may lead to unnecessarily heavy designs in some cases;

f) material properties and characteristics shall be considered and safety margins selected accordingly;

g) established analysis and design standards and relevant Codes, including textbooks, handbooks and expert publications may be applicable or may give the necessary design input to validate the design. This would include materials, parameters, safety factors etc.;

h) when using calculation methods, whether traditional or finite element analysis, due consideration should be given to the inclusion of the inherent simplifications and error factors as well as any assumptions e.g. working to design criteria which are based on known acceptable stress limits rather than ultimate tensile strength;

i) it is important that suitable material be selected dependent upon the application and loading conditions. Material properties in the final use condition (i.e. after machining, heat treatment grinding etc., and accounting for use and environmental influences such as wear, corrosion) should be considered. In evaluating stress factors it is important to consider size factors, shape factors, changes in section, geometry and size of radii and fillets at section changes, surface finish, material hardness etc.;

j) it is also important to consider material properties such as ultimate tensile strength, yield strength, elongation before rupture, impact strength, fracture toughness, endurance strength etc. as applicable;

k) the applicable failure criteria need to be established, dependent upon the application, for example Tresca maximal shear stress, von Mises yield criteria, Octahedral shear stress, energy of distortion, low cycle fatigue, high cycle fatigue, Euler and Rankine elastic stability criteria etc.;

l) the designer also has the responsibility to determine whether the analyses and calculations are adequate and whether additional endurance and/or breaking tests are required;

m) good engineering practice also entails a subsequent design review by a peer(s) or expert(s) in the appropriate discipline. The peer(s) or expert(s) may be employees of the same organization responsible for the design or external experts as long as they are suitably qualified. Such practice may also be covered by the quality assurance system, e.g. ISO 9000, of the organization responsible for the design.

5.8 Authorized persons, where these persons require certification

EN 81-20 gives definitions for persons interacting with lifts. The following gives additional explanation of those persons' actions and responsibilities:

— User: person making use of the services of the lift installation which includes passengers, persons waiting at the landings and authorized persons;

— Passenger: a person who is transported in the lift car;

— Competent person: a person who has received training and can demonstrate their understanding in a specific task, such as a competent maintenance person required to return the lift back into service following an interruption in the safety circuit, or a person who has been trained to carry out the specific task of conducting passenger release in the event of a lift breakdown;

— Authorized person: a person who has received the permission of the lift owner or duty holder to be present at the lift site in order to carry out a specific task. It is therefore necessary for any authorized person to also be able to demonstrate competence in the task they undertake, e.g. persons carrying out periodic examination of lifts or insurance inspections.

It may be the case in some countries that the authorization of these persons to work on lifts is also subject to agreement/qualification by the national authorities. In this case, there may be specific certification programmes that need to be respected in order to be considered as authorized in addition to the permissions required from the owner/duty holder. Such programmes are considered as being outside the scope of the EN 81 series of standards and subject to national regulations.

NOTE ISO 22559-1 includes the definition for the non-user as: a person in the vicinity of the lift not intending to access or use the lift.

5.9 Passenger capacity

EN 81-20 is based on an average weight of a person being 75 kg, and capacity tables in 5.4.2.1 reflect this value. This is an accepted value in Europe and many other countries.

However, in some regions or counties other values for the average weight of a person with regard to lift usage may apply.

Examples are given in Table 1.

Table 1 — Passenger capacity - Examples

Country	Average weight of a person (kg) used to calculate load capacity
Australia	75
China	75
India	68
Japan	65
Korea	65
South Africa	75
USA	72,5

These alternative values may be used in order to formulate new passenger capacities according to the rated load in kg, with only the load plate displayed in the lift car according to EN 81-20:2014, 5.4.2.3.2 being affected.

This will however affect the traffic design and handling which will be based on the number of persons being moved within a specified time limit.

It is recommended that all car sizes be based on those found in the ISO 4190 series.

5.10 References to EN standards

In order to unify the requirements at an international level, EN 81-20 and EN 81-50 refer to ISO or IEC versions of documents supporting the standard wherever possible. However, there is a need in some areas of design to quote either specific EN standards, which are harmonized to European legislation, or EN standards for which there are no ISO or IEC equivalents.

Some countries that wish to adopt EN 81-20 and EN 81-50 standards may not have implemented these EN standards for various socio-economic reasons and/or national law. In this case, it may be appropriate for them to use their own National standards as substitutes while still maintaining the same level of safety. The case for using such National standards can only be made by the local authority in the appropriate country. The following table lists all other standards referenced in EN 81-20 and EN 81-50 standards and provides information related to possible alternatives.

Table 2 and Table 3 give the list of equivalent ISO/IEC documents to the standards referenced in EN 81-20 and EN 81-50.

Table 2 — References of standards within EN 81–20:2014

Reference of standards	Equivalent ISO/IEC	Remarks
EN 81–21, *Safety rules for the construction and installation of lifts - Lifts for the transport of persons and goods - Part 21: New passenger and goods passenger lifts in existing building*	None	EN 81–21 is applicable for existing buildings, when building dimensions may not allow full compliance to EN 81–20. Therefore, it is not necessary to have EN 81–21 as national standard to comply with EN 81–20 requirements.
EN 81–28, *Safety rules for the construction and installation of lifts – Lifts for the transport of persons and goods - Part 28: Remote alarm on passenger and goods passenger lifts*	None	Previous text from EN 81–1 and EN 81–2 may be suitable for use in some countries.
EN 81–50, *Safety rules for the construction and installation of lifts – Examinations and tests - Part 50: Design rules, calculations, examinations and tests of lift components*	None	
EN 81–58, *Safety rules for the construction and installation of lifts - Examinations and tests - Part 58: Landing door fire resistance test*	None	Some countries are using BS 476–22, EN 1634–1 or ISO 3008-1. ISO 3008-2, specifically for lift landing doors, is under development.
EN 131–2:2010+A1:2012, *Ladders - Requirements, testing, marking*	None	
EN 1993–1-1, *Eurocode 3 - Design of steel structures - Part 1–1: General rules and rules for buildings*	None	
EN 10305–1, *Steel tubes for precision applications - Technical delivery conditions - Seamless cold drawn tubes*	None	
EN 10305–2, *Steel tubes for precision applications - Technical delivery conditions - Welded cold drawn tubes*	None	
EN 10305–3, *Steel tubes for precision applications - Technical delivery conditions - Welded cold sized tubes*	None	
EN 10305–4, *Steel tubes for precision applications - Technical delivery conditions - Part 4: Seamless cold drawn tubes for hydraulic and pneumatic power systems*	None	
EN 10305–5, *Steel tubes for precision applications - Technical delivery conditions - Part 5: Welded cold sized square and rectangular tubes*	None	
EN 10305–6, *Steel tubes for precision applications - Technical delivery conditions - Part 6: Welded cold drawn tubes for hydraulic and pneumatic power systems*	None	
EN 12015, *Electromagnetic compatibility - Product family standard for lifts, escalators and passenger conveyors - Emission*	None	ISO 22199 is being aligned with EN 12015

EN 12016, *Electromagnetic compatibility - Product family standard for lifts, escalators and passenger conveyors - Immunity*	None	ISO 22200 is being aligned with EN 12016
EN 12385–5, *Steel wire ropes - Safety - Stranded ropes for lifts*	None	
EN 12600:2002, *Glass in building - Pendulum test - Impact test method and classification for flat glass*	None	
EN 13015, *Maintenance for lifts and escalators - Rules for maintenance instructions*	None	
EN 13501–1, *Fire classification of construction products and building elements - Part 1: Classification using test data from reaction to fire tests*	None	
EN 50205, *Relays with forcibly guided (mechanically linked) contacts*	None	
EN 50214, *Flat polyvinyl chloride sheathed flexible cables*	IEC 60227–6:2001	
EN 50274, *Low-voltage switchgear and controlgear assemblies - Protection against electric shock - Protection against unintentional direct contact with hazardous live parts*	None	
EN 60204–1:2006, *Safety of machinery - Electrical equipment of machines - Part 1: General requirements*	IEC 60204–1:2006	
EN 60529, *Specification for degrees of protection provided by enclosures (IP Code)*	IEC 60529	
EN 60664–1, *Insulation coordination for equipment within low-voltage systems - Part 1: Principles, requirements and tests*	IEC 60664–1	
EN 60947–4-1:2010, *Low-voltage switchgear and controlgear - Part 4: Contactors and motor-starters - Section 1: Electromechanical contactors and motor-starters*	IEC 60947–4-1:2009	
EN 60947–5-1:2004, *Low-voltage switchgear and controlgear - Part 5: Control circuit devices and switching elements - Section 1: Electromechanical control circuit devices*	IEC 60947–5-1:2003	
EN 60947–5-5, *Low-voltage switchgear and controlgear - Part 5: Control circuit devices and switching elements - Section 5: Electrical emergency stop devices with mechanical latching function*	IEC 60947–5-5	
EN 61310–3, *Safety of machinery - Indication, marking and actuation - Requirements for the location and operation of actuators*	IEC 61310–3	
EN 61800–5-2:2007, *Adjustable speed electrical power drive systems – Part 2: Safety requirements. Functional*	IEC 61800–5-2:2007	
EN 61810–1, *Electromechanical elementary relays - Part 1: General requirements*	IEC 61810–1	
EN ISO 12100:2010, *Safety of machinery - General principles for design– Risk assessment and risk reduction*	ISO 12100:2010	
EN ISO 13857:2008, *Safety of machinery - Safety distances to prevent danger zones being reached by the upper and lower limbs*	ISO 13857:2008	

HD 60364–4-41:2007, *Low voltage electrical installations - Part 4–41: Protection for safety - Protection against electric shock*	IEC 60364–4-41:2005	
HD 60364–4-42:2011, *Low voltage electrical installations - Part 4–42: Protection for safety - Protection against thermal effects*	IEC 60364–4-42:2010	
HD 60364–6:2007, *Low voltage electrical installations - Part 6: Verification*	IEC 60364–6:2006	
IEC 60227–6, *Polyvinyl chloride insulated cables of rated voltages up to and including 450/750 V - Part 6: Lift cables and cables for flexible connections*	IEC 60227–6	
IEC 60245–5, *Rubber insulated cables - Rated voltages up to and including 450/750 V - Part 5: Lift cables*	IEC 60245–5	
IEC 60417, *Database - Graphical symbols for use on equipment*	IEC 60417	
IEC 60617, *Graphical symbols for diagrams*	IEC 60617	
ISO 1219-1, *Fluid power systems and components - Graphic symbols and circuit diagrams - Part 1: Graphic symbols for conventional use and data-processing applications*	ISO 1219-1	

Table 3 — References of standards within EN 81–50:2014

Reference of standards	Equivalent ISO/IEC	Remarks
EN 81–20:2014, *Safety rules for the construction and installation of lifts – Lifts for the transport of persons and goods - Part 20: Passenger and goods passenger lifts*	None	
EN 10025 (all parts), *Hot rolled products of non-alloy structural steels - Technical delivery conditions*	None	
EN 12385–5, *Steel wire ropes - Safety - Part 5: Stranded ropes for lifts*	None	
EN 60068–2-6, *Environmental testing - Part 2: Tests – Test Fc: Vibration (sinusoidal)*	IEC 60068–2-6	
EN 60068–2-14, *Environmental testing - Part 14: Tests –Test N. Change of temperature*	EN 60068–2-14	
EN 60068–2-27, *Basic environmental testing procedures - Part 2: Tests - Test Ea and guidance: Shock*	IEC 60068–2-27	
EN 60112, *Method for the determination of the proof and the comparative tracking indices of solid insulating materials*	IEC 60112	
EN 60664–1:2007, *Insulation coordination for equipment within low-voltage systems - Part 1: Principles, requirements and tests*	IEC 60664–1:2007	
EN 60947–4-1, *Low-voltage switchgear and controlgear - Part 4: Contactors and motor-starters - Section 1: Electromechanical contactors and motor-starters*	IEC 60947–4-1	
EN 60947–5-1, *Low-voltage switchgear and controlgear - Part 5: Control circuit devices and switching elements - Section 1: Electromechanical control circuit devices*	IEC 60947–5-1	
EN 61508–1:2010, *Functional safety of electrical/electronic/programmable electronic safety-related systems - Par 1: General requirements (*IEC 61508–1:2010*)*	IEC 61508–1:2010	
EN 61508–2:2010, *Functional safety of electrical/electronic/programmable electronic safety-related systems - Par 2: Requirements for electrical/electronic/programmable electronic safety-related systems*	IEC 61508–2:2010	
EN 61508–3:2010, *Functional safety of electrical/electronic/programmable electronic safety related systems - Par 3: Software requirements*	IEC 61508–3:2010	
EN 61508–7:2010, *Functional safety of electrical/electronic/programmable electronic safety related systems - Part 7: Overview of techniques and measures*	IEC 61508–7:2010	
EN ISO 12100:2010, *Safety of machinery - General principles for design - Risk assessment and risk reduction*	ISO 12100:2010	

5.11 Specific National Requirements

5.11.1 Applicability of EN 81-20 and EN 81-50 in countries and jurisdictions enforcing other standards

In countries that do not enforce EN 81-20 and EN 81-50, national standards may be applicable. EN 81-20 and EN 81-50 may still be valuable as a source of reference, and for establishing safety measures where gaps in requirements are evident. National laws, regulations and adopted standards to be complied with according to specific national or jurisdictional requirements.

5.11.2 Safe access to machinery spaces (particularly machine and pulley rooms)

While EN 81-20 gives the minimum requirements for safe access to the machine and pulley room, there are some countries where these requirements may be the subject of National Building regulations.

As an example EN 81-20 gives the minimum requirements for access ladders to these rooms, but some national building regulations may require that the access to such rooms is entirely by way of stairs and that access by ladder is forbidden. Such requirements do not affect the supply of the lift and are therefore not a barrier to trade. In this case, EN 81-20 can be seen as giving the minimum requirements where no such national regulation exists.

5.11.3 Emergency lighting

Emergency lighting is often subject to national building regulations and therefore very difficult to include in product standards. These national regulations often specify such requirements as light level, number of lamps, periodic discharge tests, etc. For this reason, EN 81-20 only gives the requirements for emergency lighting delivered with the lift inside the car and on the car roof.

All other emergency lighting is to be provided in accordance with national regulation, where required.

5.11.4 Sprinkler systems

Sprinkler systems that discharge in the event of fire in a building compartment are often subject to national building regulations and therefore very difficult to include in product standards. For this reason, EN 81-20 only gives general requirements for fire protection systems in the machine room.

Where sprinklers are required by national regulation in other machinery spaces and in the well great care shall be taken not to cause significant additional hazards to persons working in these spaces or travelling as passengers in the lift car.

For this reason, it is recommended that the lift be stationary at a floor, allowing the passengers to leave the lift car and then remove the power to the lift before sprinklers are allowed to discharge in these areas.

5.11.5 Specific restrictions

Some countries outside Europe have made specific rules regarding some of the equipment or features described in EN 81-20. In some cases, features included in EN 81-20 might be forbidden in these countries due to specific safety concerns due to historic reasons or perceived behavioural concerns with persons attending in the event of maintenance or rescue operations.

In addition, items in EN 81-1 and EN 81-2 that do not appear in EN 81-20 may still be found in some regions and allowed by their national authorities, e.g. fly-ball overspeed governor or buffered safety gear requirements.

Annex A
(informative)

Correlation table between EN 81-1, EN 81-2 and EN 81-20 and EN 81-50

A.1 Introduction

This annex has been prepared to allow the user to compare the existing standards EN 81-1:1998, and EN 81-2:1998, and their respective amendments A1:2005, A2:2004 and A3:2009 with the revision of these standards into EN 81-20:2014 and EN 81-50:2014.

The revision of these standards EN 81-1 and EN 81-2 was mandated by CEN with reference to the 10 year updating of European Standards and to bring these standards in line with CEN Guide 414 with regards the format and structure.

On this basis, the revision of EN 81-1 and EN 81-2 has resulted in a total restructuring of both documents in such a way that:

a) EN 81-1 and EN 81-2 have been merged where possible in order to avoid repetition of safety requirements in both documents;

b) This resulting document has been split in two standards: EN 81-20; and EN 81-50;

c) Both these last documents are formatted according to CEN Guide 414 requirements;

d) The determination of safety requirements has been reviewed on the basis of hazard analysis and risk assessment.

Additionally safety requirements related exclusively to the lift installation are contained in Clause 5 of the revised respective standards. Other safety requirements are detailed in normative and informative annexes.

A.2 Correlation between EN 81-1 and EN 81-2, and EN 81-20 and EN 81-50

Table A.1 provides a correlation between EN 81-1:1998+A3:2009 respectively EN 81-2:1998+A3:2009 and EN 81-20:2014 and EN 81-50:2014 based upon the sequence of chapters, sub clauses and paragraphs of EN 81-1:1998+A3:2009 respectively EN 81-2:1998+A3:2009.

Table A.2 provides a similar correlation but using EN 81-20:2014 as the base document for comparison to EN 81-1:1998+A3:2009 and EN 81-2:1998+A3:2009.

Table A.3 provides a similar correlation but using EN 81-50:2014 as the base document for comparison to EN 81-1:1998+A3:2009 and EN 81-2:1998+A3:2009.

Each clause is cross-referenced to its equivalent clause and the table illustrates the status of the text or requirement. Guidance is given on whether the clause remained unchanged, is modified, is new or has been deleted. Where appropriate a short explanation is given in the “Remarks” column to highlight changes and new requirements contained in the revision of EN 81-1:1998+A3:2009 and EN 81-2:1998+A3:2009.

Table A.1 — Correlation between clauses of EN 81–1:1998+A3:2009, respectively EN 81–2:1998+A3:2009 and EN 81–20:2014 and EN 81–50:2014 in the order of EN 81–1:1998+A3, respectively EN 81–2:1998+A3:2009 sequence

EN 81–1:1998+A3:2009	EN 81–2:1998+A3:2009	EN 81–20:2014	EN 81–50:2014	Unchanged	Modified	New	Deleted	Remarks
—	—	0				✓		Introduction
0.1	0.1	0.1		✓				Introduction – General
—	—	0.2				✓		Introduction – General
0.2	0.2	0.3			✓			Introduction – Principles
0.3	0.3	0.4			✓			Introduction - Assumptions
1	1	1		✓				Scope
1.1	1.1	1.1			✓			
1.2	1.2	1.2			✓			
1.3	1.3	1.3			✓			
1.4	1.4	1.4			✓			
2	2	2	2		✓			Normative references
3	3	3	3		✓			Terms and definitions
4	4	4	—			✓		List of significant hazards
4.1	4.1	—	—				✓	
4.2	4.2	—	—				✓	
5	5	5.2.5			✓			Lift well
5.1	5.1	5.2.5.1			✓			Lift well - General provisions
5.2	5.2	5.2.5.2			✓			Lift well - Enclosure
5.3	5.3	5.2.1.8.1			✓			Lift well - Walls, floor and ceiling
5.4	5.4	5.2.5.3			✓			Lift well - Walls and doors facing the car.
5.5	5.5	5.2.5.4			✓			Lift well - Spaces under pit
5.6	5.6	5.2.5.5			✓			Lift well - Protection
5.7	5.7	5.2.5.7, 5.2.5.8			✓			Lift well - Headroom and pit
5.8	5.8	5.2.1.2, 5.2.1.2.1, 5.2.1.5.3			✓			Exclusive use of well and machinery spaces
5.9	5.9	5.2.1.4, 5.2.1.4.1			✓			Lighting of well
5.10	5.10	5.2.1.6			✓			Lift well - Emergency release
6	6	5.2.6			✓			Machinery and pulley Spaces
6.1	6.1	5.2.2.1, 5.2.6.1			✓			Machinery and pulley spaces - General

EN 81–1:1998+A3:2009	EN 81–2:1998+A3:2009	EN 81–20:2014	EN 81–50:2014	Unchanged	Modified	New	Deleted	Remarks
6.2	6.2	5.2.2			✓			Machinery and pulley spaces - Access
6.3	6.3	5.2.6.3			✓			Machinery in a machine room
6.4	6.4	5.2.6.4			✓			Machinery inside the well
6.5	6.5	5.2.6.5			✓			Machinery outside the well
6.6	6.6	5.2.6.6			✓			Devices for emergency and test operation
6.7	6.7	5.2.6.7			✓			Construction and equipment of pulley spaces
7	7	5.3			✓			Landing doors
7.1	7.1	5.3.1 5.3.1.1 5.3.1.2 5.3.1.3 5.3.1.4 5.3.1.5			✓			Landing doors - General provisions
7.2	7.2	5.3.5, 5.3.5.1			✓			Landing doors - Strength
7.3	7.3	5.3.2		✓				Landing Doors - Height and width
7.4	7.4	5.3.3			✓			Landing door - Sills, guides and suspension
7.5	7.5	5.3.6			✓			Landing door - protection
7.6	7.6	5.3.7			✓			Landing door - Lighting and “car here”
7.7	7.7	5.3.8			✓			Landing door - Locking and closed check
7.8	7.8	5.3.12			✓			Landing door - Closing of automatic operated doors
8	8	5.4		✓				Car, counterweight and balancing weight
8.1	8.1	5.4.1		✓				Height of car
8.2	8.2	5.4.2			✓			Available car area, rated load, number of passengers
8.3	8.3	5.4.3			✓			Car walls, floor and roof
8.4	8.4	5.4.5			✓			Car apron
8.5	8.5	5.3.1.1		✓				Car entrance

EN 81–1:1998+A3:2009	EN 81–2:1998+A3:2009	EN 81–20:2014	EN 81–50:2014	Unchanged	Modified	New	Deleted	Remarks
8.6	8.6	5.3			✓			Car doors
8.7	8.7	5.3.6			✓			Car doors - Protection during operation of doors
8.8	8.8	5.3.6.3			✓			Car doors - Reversal of closing
8.9	8.9	5.3.13			✓			Car doors - Device to prove closed position
8.10	8.10	5.3.14			✓			Car doors - Panel linkage
8.11	8.11	5.3.15			✓			Car door - Opening
8.12	8.12	5.4.6			✓			Car emergency doors and trapdoors
8.13	8.13	5.4.7			✓			Car roof
8.14	8.14	–-	–-				✓	Car header
8.15	8.15	5.4.8			✓			Equipment on top of the car
8.16	8.16	5.4.9		✓				Car ventilation
8.17	8.17	5.4.10			✓			Car lighting
8.18	8.18	5.4.11, 5.4.11.1			✓			Counterweight and balancing weight
9	9	5.5			✓			Suspension, compensation, overspeed protection and uncontrolled car movement protection
9.1	9.1	5.5.1			✓			Suspension
9.2	9.2	5.5.2			✓			Sheave, pulley, drum and rope chain diameter and rope/chain terminations
9.3		5.5.3			✓			Rope traction
	9.3				✓			Distribution of load
9.4		5.5.4			✓			Winding up of ropes for positive drive lifts
	9.4				✓			Protection for pulleys and sprockets
9.5		5.5.5			✓			Distribution of load on rope and chain
	9.5				✓			Precaution against free fall
9.6		5.5.6			✓			Compensation with ropes
	9.6				✓			Fall of balance weight
9.7	Not used	5.5.7			✓			Protection for traction sheaves, pulleys, sprockets

EN 81–1:1998+A3:2009	EN 81–2:1998+A3:2009	EN 81–20:2014	EN 81–50:2014	Unchanged	Modified	New	Deleted	Remarks
9.8	9.8	5.6.2.1			✓			Safety gear
9.9		5.6.2.2.1			✓			Overspeed governor
	9.9	—	—				✓	Clamping device
9.10		5.6.6			✓			Ascending overspeed protection
	9.10	5.6.2.2			✓			Tripping means for safety gears
9.11		5.6.7			✓			Protection against unintended car movement
	9.11	5.6.5			✓			Pawl device
–-	9.12	5.12.1.10			✓			Electrical anti-creep system
–-	9.13	5.6.7			✓			Protection against unintended car movement
10	10	5.7, 5.8, 5.12.2			✓			Guide rails, buffers and final limits
10.1	10.1	5.7.2.1			✓			General provisions
10.2	10.2	5.7.1			✓			Guiding of car, counterweight and balancing weight
10.3	10.3	5.8.1			✓			Car and counterweight buffers
10.4	10.4	5.8.2			✓			Stroke of car and counterweight buffer
10.5	10.5	5.12.2			✓			Final limits
11	11	5.2.5.3		✓				Clearances between car and wall, counterweight
11.1	11.1	0.4.4		✓				General provision
11.2	11.2	5.2.5.3.1		✓				Clearances
11.3	11.3	5.2.5.5.1		✓				Clearance between car, counterweight and balancing weight
12	12	5.9			✓			Lift machine
12.1	12.1	5.9.1, 5.9.1.1		✓				Independent machine
12.2		5.9.2			✓			Drive for traction lifts
	12.2	5.9.3.2			✓			Jack
12.3		–-					✓	Use of overhung pulleys / sprockets
	12.3	5.9.3.3		✓				Piping
12.4	12.4	5.9.2.2			✓			Braking system

EN 81–1:1998+A3:2009	EN 81–2:1998+A3:2009	EN 81–20:2014	EN 81–50:2014	Unchanged	Modified	New	Deleted	Remarks
		5.9.2.5			✓			Stopping the machine and checking its stopped condition
12.5		5.9.2.3			✓			Emergency operation
	12.5	5.9.3.5			✓			Hydraulic control and safety devices
12.6		5.9.2.4		✓				Speed
	12.6	5.9.3.6			✓			Checking the pressure
12.7		5.9.2.5			✓			Stopping the machine
	12.7	5.9.3.7		✓				Tank
12.8		5.12.1.3			✓			Monitoring of slowdown
	12.8	5.9.2.4		✓				Speed
12.9		5.5.5.3			✓			Slack rope or chain
	12.9	5.9.2.3			✓			Emergency operation
12.10		5.9.2.7		✓				Run time limiter
	12.10	5.5.7		✓				Protection of the pulleys or sprockets on the jack
12.11	12.11	5.9.1.2			✓			Protection of machinery
12.12		5.12.1.1.4		✓				Normal stopping / levelling accuracy
	12.12	5.9.3.10		✓				Run time limiter
––	12.13	5.5.5.3			✓			Slack rope or chain device
––	12.14	5.9.3.11		✓				Protection against overheating of the hydraulic fluid
––	12.15	5.12.1.1.4		✓				Normal stopping / levelling accuracy
13	13	5.10		✓				Electrical installation and appliances
13.1	13.1	5.10.1			✓			General provisions
13.2	13.2	5.10.3			✓			Contactors, relay-contactors, components of safety circuits
13.3	13.3	5.10.4			✓			Protection of motors and other equipment
13.4	13.4	5.10.5			✓			Main switches
13.5	13.5	5.10.6			✓			Electric wiring
13.6	13.6	5.10.7			✓			Lighting and socket outlets

EN 81–1:1998+A3:2009	EN 81–2:1998+A3:2009	EN 81–20:2014	EN 81–50:2014	Unchanged	Modified	New	Deleted	Remarks
14	14	5.11		✓				Protection against electrical faults, controls, priorities
14.1	14.1	5.11			✓			Failure analysis and electrical safety devices
14.2	14.2	5.12			✓			Controls
15	15	–-					✓	Notices, markings, operating instructions
15.1	15.1	5.1.2		✓				General provisions
15.2	15.2	5.4.2.3.2			✓			Car
15.3	15.3	5.12.1.11.1, 5.12.1.5.2.3		✓				Car roof
15.4	15.4	5.2.6.2			✓			Machinery and pulley spaces
15.5	15.5	5.2.4.2			✓			Well
15.6	15.6	5.6.2.2.1.8			✓			Overspeed governor
15.7	15.7	5.12.1.5.2.3			✓			Pit
15.8	15.8	5.8.1.8			✓			Buffers
15.9	15.9	5.12.1.1.3			✓			Landing identification
15.10	15.10	5.10.10, 5.11.2.3.5			✓			Electrical identification
15.11	15.11	7.2.2			✓			Unlocking key
15.12	15.12	–-					✓	Alarm device
15.13	15.13	5.3.9.1.13			✓			Locking device
15.14	15.14	5.6.2.1.1.3			✓			Safety gear
15.15		5.2.1.1.2		✓				Groups of lifts
	15.15	5.9.3.9.1.6		✓				Emergency lowering valve
15.16		5.6.6.12			✓			Ascending car overspeed
	15.16	5.9.3.9.2.4		✓				Hand pump
–-	15.17	5.2.1.1.2		✓				Groups of lifts
–-	15.18	5.9.3.7		✓				Tank
–-	15.19	5.6.3.9			✓			Rupture valve / one way restrictor
16	16	6					✓	Examinations, tests, register, maintenance
16.1	16.1	6.1			✓			Examinations and tests

EN 81–1:1998+A3:2009	EN 81–2:1998+A3:2009	EN 81–20:2014	EN 81–50:2014	Unchanged	Modified	New	Deleted	Remarks
16.2	16.2	7.2, 7.3.1, 7.3.2			✓			Register
16.3	16.3	7, 7.1, 7.2, 7.2.1			✓			Installer information
Annex A	Annex A	Annex A			✓			List of electrical safety devices
Annex B	Annex B	5.3.9.3.1			✓			Unlocking triangle
Annex C	Annex C	Annex B			✓			Technical dossier
Annex D	Annex D	6.3			✓			Examinations and test before putting into service
Annex E	Annex E	Annex C			✓			Periodic Examinations and
Annex F	Annex F	–-	5.1	✓				Safety Components - Test procedures for verification of conformity
Annex F.0	Annex F.0	–-	5.1.1	✓				Introduction
Annex F.1	Annex F.1	–-	5.2	✓				Landing door locks
Annex F.2	Annex F.2	–-	–-				✓	Kept free
Annex F.3	Annex F.3	–-	5.3		✓			Safety Gear
Annex F.4	Annex F.4	–-	5.4	✓				Overspeed Governor
Annex F.5	Annex F.5	–-	5.5		✓			Buffers
Annex F.6	Annex F.6	–-	5.6, 5.6.1	✓				Type examination of safety circuits (PESSRAL)
Annex F.7		–-	5.7	✓				Ascending car overspeed protection means
	Annex F.7	–-	5.9	✓				Rupture valve/ One way
Annex F.8	–-	–-	5.8	✓				Unintended car movement protection means
Annex G	Annex G	5.7.2, 5.7.3, 5.7.4	5.10, Annex C				✓	Proof of guide rails
Annex H	Annex H	–-	5.15		✓			Electronic components -
Annex J	Annex J	–-	5.14		✓			Pendulum shock tests
Annex K		–-	–-		✓			Top clearance for traction drive lifts
	Annex K	–—	5.13				✓	Calculation of jacks
Annex L		–-	–-				✓	Necessary buffer stroke
	Annex L	–-	Annex C		✓			Measures for failure control
Annex M		–-	5.11, Annex D		✓			Evaluation of traction
	Annex M	Annex D	–-	✓				Machinery spaces

EN 81–1:1998+A3:2009	EN 81–2:1998+A3:2009	EN 81–20:2014	EN 81–50:2014	Unchanged	Modified	New	Deleted	Remarks
Annex N	—	—	5.12, Annex E		✓			Evaluation of safety factor for suspension ropes
Annex O	—	Annex D		✓				Machinery spaces
Annex P	—	—	Annex B		✓			Measures for failure control
Annex ZA	Annex ZA	Annex ZA	Annex ZA		✓			Relationship between standard and essential safety

Table A.2 — Correlation between clauses of EN 81–20:2014 and EN 81–1:1998+A3:2009 and EN 81–1:1998+A3:2009 in the order of EN 81–20:2014 sequence

EN 81–20:2014	EN 81–1:1998+A3:2009	EN 81–2:1998+A3:2009	Unchanged	Modified	New	Deleted	Remarks
0	0	0	✓				Introduction
0.1	0.1	0.1	✓				Introduction - General
0.2	0.2	0.2	✓				Introduction - Principals
0.3	0.3	0.3		✓			Introduction - Assumptions
1	1	1	✓				Scope
1.1	1.1	1.1	✓				Scope
1.2	1.2	1.2	✓				Scope
1.3	1.3, 1.4	1.3, 1.4		✓			Scope
2	2	2		✓			Normative references
3	3	3		✓			Terms and definitions
—	4	4				✓	Units and symbols
—	4.1	4.1				✓	
—	4.2	4.2				✓	
4	—	—			✓		List of significant hazards
5.2.1.1.2	—	15.17		✓			Groups of lifts
5.2.1.1.2	15.15		✓				Groups of lifts
5.1.2	15.1	15.1	✓				General provisions
5.2.1.2	5.8	5.8		✓			Exclusive use of well and machinery spaces
5.2.1.2	5.9	5.9		✓			Lighting of well
5.2.1.5.1	15.7	15.7		✓			Pit

EN 81–20:2014	EN 81–1:1998+A3:2009	EN 81–2:1998+A3:2009	Unchanged	Modified	New	Deleted	Remarks
5.2.1.6	5.10	5.10		✓			Lift Well - Emergency release
5.2.1.8	5.3	5.3		✓			Lift Well - Walls, floor and ceiling
5.2.2	6.2	6.2		✓			Machinery and pulley spaces - Access
5.2.2.1	6.1	6.1		✓			Machinery and pulley spaces - General
5.2.4.1	15.4	15.4		✓			Machinery and pulley spaces
5.2.4.2	15.5	15.5		✓			Well
5.2.5	5	5	✓				Lift well
5.2.5.1	5.1	5.1		✓			Lift well - General provisions
5.2.5.2	5.2	5.2		✓			Lift well - Enclosure
5.2.5.3	5.4, 11	5.4, 11		✓			Clearances between car and wall, counterweight
5.2.5.3.1	11.1	11.1	✓				General provision
5.2.5.3.2	11.2	11.2	✓				Clearances
5.2.5.3.3	11.3	11.3	✓				Clearances between car, counterweight and balancing weight
5.2.5.4	5.5	5.5		✓			Lift well – Spaces under pit
5.2.5.3	5.4	5.4		✓			Lift well - Walls and doors facing the car
5.2.5.3.1	11.1	11.1		✓			General provision
5.2.5.3.3	11.3	11.3		✓			Clearance between car, counterweight and balancing weight
5.2.5.4	5.5	5.5		✓			Lift well - Spaces under pit
5.2.5.5	5.6	5.6		✓			Lift well - Protection
5.2.5.6	5.7	5.7		✓			Lift well - Headroom and pit
5.2.5.7	5.7	5.7		✓			Lift well - Headroom and pit
5.2.5.8	5.7	5.7		✓			Lift well - Headroom and pit
5.2.6	6	6		✓			Machinery and pulley spaces
5.2.6.3	6.3, 12.3	6.3		✓			Machinery in a machine room
5.2.6.4	6.4	6.4		✓			Machinery inside the well
5.2.6.5	6.5	6.5		✓			Machinery outside the well
5.2.6.6	6.6	6.6		✓			Devices for emergency and test operation
5.2.6.7	6.7	6.7		✓			Construction and equipment of pulley spaces

EN 81–20:2014	EN 81–1:1998+A3:2009	EN 81–2:1998+A3:2009	Unchanged	Modified	New	Deleted	Remarks
5.3.1	7, 8.6	7, 8.6		✓			Car and landing doors
5.3.1	7.1	7.1		✓			Landing doors - General provisions
5.3.2	7.3	7.3	✓				Landing doors - Height and width
5.3.3	7.4	7.4		✓			Landing door - Sills, guides and suspension
5.3.5	7.2	7.2		✓			Landing doors - Strength
5.3.9	7.5, 8.7	7.5, 8.7		✓			Protection during operation of doors
5.3.9.3	8.8	8.8		✓			Car doors – Reversal of closing
5.3.10	7.6	7.6		✓			Landing door - Lighting and “car here”
5.3.11	7.7	7.7		✓			Landing door - Locking and closed check
5.3.12.1.12	15.13	15.13		✓			Locking device
5.3.12.2	Annex B	Annex B		✓			Unlocking triangle
5.3.14	8.10	8.10		✓			Car doors - Panel linkage
5.3.15	7.8	7.8		✓			Landing door - Closing of automatic operated doors
5.3.16	8.9	8.9		✓			Car doors - Device to prove closed
5.3.17	8.11	8.11		✓			Car door - Opening
5.3.18	8.5	8.5	✓				Car entrance
5.4	8	8	✓				Car, counterweight and balancing weight
5.4.1	8.1	8.1	✓				Height of car
5.4.2	8.2	8.2		✓			Available car area, rated load, number of passengers
5.4.3	8.3	8.3		✓			Car walls, floor and roof
5.4.5	8.4	8.4		✓			Car apron
5.4.6	8.12	8.12		✓			Car emergency doors and trap doors
5.4.7	8.13	8.13		✓			Car roof
5.4.7.7	15.3	15.3	✓				Car roof
5.4.8	8.15	8.15		✓			Equipment on top of the car
5.4.9	8.16	8.16	✓				Car ventilation
5.4.10	8.17	8.17		✓			Car lighting
5.4.11	8.18	8.18	✓				Counterweight and balancing weight

EN 81–20:2014	EN 81–1:1998+A3:2009	EN 81–2:1998+A3:2009	Unchanged	Modified	New	Deleted	Remarks
5.5	9	9		✓			Suspension, compensation, overspeed protection and uncontrolled movement protection
5.5.1	9.1	9.1		✓			Suspension
5.5.2	9.2	9.2		✓			Sheave, pulley, drum and rope chain diameter and rope/chain terminations
5.5.2.3.2	15.2	15.2		✓			Car
5.5.3	9.3	9.3		✓			Rope traction
5.5.4	9.4	9.4		✓			Winding up of ropes for positive drive lifts
5.5.5	9.5	9.5		✓			Distribution of load on rope and chain
5.5.6	9.6	9.6		✓			Compensation with ropes
5.5.7	9.7	9.7, 12.10		✓			Protection for traction sheaves, pulleys, sprockets
5.6.2.1	9.8, 15.14	9.8, 15.14		✓			Safety gear
5.6.2.2.1	9.9	9.10		✓			Tripping by overspeed governor
5.6.3.9	–-	15.19		✓			Rupture valve / one way restrictor
5.6.5	–-	9.11		✓			Pawl device
5.6.6	9.10, 15.16	–-		✓			Ascending overspeed protection
5.6.7	9.11	9.13		✓			Protection against unintended car movement
5.7	10	10		✓			Guide rails, buffers and final limit switches
5.7.1	10.2	10.2		✓			Guiding of car, counterweight and balancing weight
5.7.2.1	10.1	10.1		✓			General provisions
5.8	10	10		✓			Guide Rails, buffers and final limits
5.8.1	10.3, 15.8	10.3, 15.8		✓			Car and counterweight buffers
5.8.2	10.4	10.4		✓			Stroke of car and counterweight buffer
5.8.2.8	12.10	12.12	✓				Run time limiter
5.9	12	12		✓			Lift machine
5.9.1	12.1	12.1	✓				Independent machine
5.9.1.2	12.11	12.11		✓			Protection of machinery
5.9.2	12.2	–-		✓			Drive for traction lifts
5.9.2.2	12.3	–-		✓			Braking system
5.9.2.3	12.4	12.9		✓			Emergency operation

EN 81–20:2014	EN 81–1:1998+A3:2009	EN 81–2:1998+A3:2009	Unchanged	Modified	New	Deleted	Remarks
5.9.2.4	12.6	12.8	✓				Speed
5.9.2.5	12.7	12.4		✓			Stopping the machine and checking its stopped condition
5.9.3.2		12.2		✓			Jack
5.9.3.3		12.3	✓				Piping
5.9.3.5		12.5		✓			Hydraulic control and safety devices
5.9.3.6		12.6		✓			Checking the pressure
5.9.3.7		12.7, 15.18	✓				Tank
5.9.3.9.1.6		15.15	✓				Emergency lowering valve
5.9.3.9.2.4		15.16	✓				Hand pump
5.9.3.11	–-	12.14	✓				Protection against overheating of the hydraulic fluid
5.10	13	13	✓				Electrical installation and appliances
5.10.1	13.1	13.1		✓			General provisions
5.10.3	13.2	13.2		✓			Contactors, relay-contactors, components of safety circuits
5.10.4	13.3	13.3		✓			Protection of motors and other equipment
5.10.5	13.4	13.4		✓			Main switches
5.10.6	13.5	13.5		✓			Electric wiring
5.10.7	13.6	13.6		✓			Lighting and socket outlets
5.10.10	15.10	15.10	✓				Electrical identification
5.11	14	14	✓				Protection against electrical faults, controls, priorities
5.11.1	14.1	14.1		✓			Failure analysis and electrical safety devices
5.12	10	10		✓			Guide rails, buffers and final limits
5.12	14.2	14.2		✓			Controls
5.12.1.3	12.8			✓			Monitoring of slowdown
5.12.1.1.3	15.9	15.9	✓				Landing identification
5.12.1.1.4	12.12	12.15	✓				Normal stopping / levelling accuracy
5.12.1.10	–-	9.12		✓			Electrical anti-creep system
5.12.2	10.5	10.5		✓			Final limits
6.1	16.1	16.1		✓			Examinations and tests

EN 81–20:2014	EN 81–1:1998+A3:2009	EN 81–2:1998+A3:2009	Unchanged	Modified	New	Deleted	Remarks
6.3	Annex D	Annex D		✓			Examinations and test before putting into service
7.1	16.3	16.3		✓			Installer information
7.1.1	15.11	15.11		✓			Unlocking key
7.2	16.2	16.2		✓			Register
Annex A	Annex A	Annex A		✓			List of electrical safety devices
Annex B	Annex C	Annex C		✓			Technical dossier
Annex C	Annex E	Annex E		✓			Periodic examinations and tests
Annex D	Annex O	–-	✓				Machinery spaces
Annex D	–-	Annex M	✓				Machinery spaces
Annex ZA	Annex ZA	Annex ZA		✓			Relationship between standard and essential requirements

Table A.3 — Correlation between clauses of EN 81–50:2014 and EN 81–1:1998+A3:2009 and EN 81–1:1998+A3:2009 in the order of EN 81–50:2014 sequence

EN 81–50:2014	EN 81–1:1998+A3:2009	EN 81–2:1998+A3:2009	Unchanged	Modified	New	Deleted	Remarks
1	1	1		✓			Scope
2	2	2		✓			Normative references
3	3	3		✓			Terms and definitions
4	—	—				✓	List of significant hazards
5.1	Annex F.0	Annex F.0	✓				Safety Components - Test procedures for verification of conformity
5.2	Annex F.1	Annex F.1		✓			Landing door locks
5.3	Annex F.3	Annex F.3		✓			Safety gear
5.4	Annex F.4	Annex F.4	✓				Overspeed governor
5.5	Annex F.5	Annex F.5		✓			Buffers
5.6	Annex F.6	Annex F.6	✓				Type examination of safety circuits (PESSRAL)
5.7	Annex F.7	—	✓				Ascending car overspeed protection means
5.8	Annex F.8	—	✓				Unintended car movement protection means
5.9	—	Annex F.7	✓				Rupture valve/ One way restrictor
5.10	Annex G	Annex G		✓			Proof of guide rails
5.11	Annex M	—		✓			Evaluation of traction
5.12	Annex N	—		✓			Evaluation of safety factor for suspension ropes
5.13	—	Annex K		✓			Calculations of rams, cylinders, rigid pipes and fittings
5.14	Annex J	Annex J		✓			Pendulum shock tests
5.15	Annex H	Annex H		✓			Electronic components - Failure exclusion
Annex B	Annex P	Annex L		✓			Measures for failure control

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