MAIN CHANGES INTRODUCED BY EN ISO 8100-1
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I thank my dear friend Mechanical Eng. Zafer Güneş for his contributions.

Driven both by technical developments and by the pressures of international trade, Europe and America have begun working towards a common set of standards. One of these efforts has covered the treatment of the lift standards. In this way the EN norm and the ISO standards have been brought under a common roof, the aim being to arrive at a description of the product on the same basis. Thus, **EN ISO 8100-1/2: 2025** will replace, in countries that use ISO, **ISO 8100-1/2:2019** and, in European Union member countries, **EN 81-20/50:2020.** (Note: The same document has been published under the number EN ISO 8100-1:2025 by CEN, ISO 8100-1:2026 by ISO and TS ISO 8100-1:2026-05 by TSE; in this study all three denote the same technical text. ISO 8100-1:2026 is the second edition of ISO 8100-1:2019 and cancels and replaces it.) CEN-TC 10-WG 1_N2250 has also given the following explanation on this subject.

"Introduction & Background
The ISO 8100-1:2025 and ISO 8100-2:2025 standards will supersede ISO 8100-1:2019 and ISO 8100-2:2019 standards. Additionally for the European Union member states they will supersede the EN81-20:2020 and EN81- 50:2020 standards.
Under a parallel approval process (Vienna Agreement) both CEN (European Committee for Standardization) and ISO (the International Organization for Standardization) will publish the standards by 31st December 2025. "
From 1st January 2026 the standards will be valid and available for all ISO affiliated countries for national adoption.
For CEN affiliated countries (EU member states) the EU version standards, EN ISO 8100-1:2025 and EN ISO 8100-2:2025 will be citated in the OJEU: Official Journal of European Union, by 1st July 2026.
From this date of citation to the date of withdrawal of EN81-20:2020 and EN81-50:2020, expected in quarter 1, 2029 the EN ISO 8100-1:2025 and EN ISO 8100-2:2025 standards will also provide presumption of conformity to the EU Lifts Directive 2014/33/EU.
At the DOW (date of withdrawal) of EN81-20:2020 and EN81-50:2020 ONLY the EN ISO 8100-1:2025 and EN ISO 8100-2:2025 standards will be valid in EU.

The purpose of this document is to outline and introduce the main changes applied to (EN) ISO 8100-1:2025 and (EN) ISO 8100-2:2025 standards to:

- *Manufacturers*
- *Installers*
- *Notified Bodies*
- *National authorities*
- *Customers and users*
- *etc.*

While parts of the referred (EN) ISO 8100-1:2025 and (EN) ISO 8100-2:2025 standards may be quoted in the text of this document (acc. CEN and ISO rules), this document is purely designed as a supportive tool to allow readers gain a deeper understanding of the changes in the standards.

This document should not be used for setting any limitations, interpretations or used as a guide for application of the standards.
The reader is solely responsible to familiarize himself/herself with the actual clauses and text of the (EN) ISO 8100-1:2025 and (EN) ISO 8100-2:2025 for complete and accurate understanding of the changes and the formulation of the requirements.

Key editorial and content updates

The (EN) ISO 8100-1:2025 and (EN) ISO 8100-2:2025 standards were jointly prepared by the Technical Committee CEN/TC 10 and the Technical Committee ISO/TC 178 to ensure a set of globally agreed and aligned standards.
Both standards have been re-structured as per ISO/IEC directives Part 2, improving the technical requirements and removing ambiguity, i.e., use of expressions / verbs like "can", "may", "should" and instead using "shall" to give clear and concise requirements.
The standards were further reworked to improve the use of, and safety of, li□s for maintenance and installation personnel, customers, owners and end users. Examples:

- *Requirements for automatic rescue opera□on have been added, and requirements for emergency opera□on revised*
- *Requirements to avoid the dragging of hands in doors have been extended*
- *Requirements for cybersecurity have been added*
- *SIL levels of the electric safety devices (Annex A) have been revised*

None specific lift requirements i.e., building requirements, were removed from the main body of the clauses and moved to a new Annex B - Information on the building-related conditions in which the lift is installed.
The standards have been also updated to include latest available li□ technologies. Examples:

- *Requirements for suspension means other than steel wire ropes have been added*
- *Requirements for tripping the safety gear by electrical means have been added*

Machinery Regulation impact assessment
Scope: Evaluation for ISO 8100-1 of the new/modified relevant MR requirements
1.1.2 (e) Principles of safety integra□on
1.1.9 Protection against corruption
1.2.1 Safety and reliability of control systems
1.2.6 Failure of the power supply or communication network connection (considered in ISO 8100-1 already)
Summary of the changes in ISO 8100-1
1- MR 1.1.2 (e): Instructions for testing of safety functions (refer to 'Safety functions and impact on ISO 8100-1 rev 2024-07- 22') To cover MR 1.1.2 (e)

- *Table 25 listing safety functions which needs additional instructions for testing*
- *Table 25 is part of the specific instructions under 6.2.4 Informa□on for maintenance, inspection, repair, and periodic checks*

2- MR 1.1.9: Identification of software to be protected against corruption

- *Information for use shall identify sw that are relevant to EHSRs for LD/MD/MR, ISO 8100-1 new clause 6.2.4*

3- MR 1.1.9: Cybersecurity for protection against corruption

- *Reference to ISO 8102-20 in ISO 8100-1: new text for clause §4.10.1.1.5*

4- MR 1.19: Capability to verify actual software revisions & parameter values

- *Requirements will be de0ned in ISO 8100-1 4.xx*

5- MR 1.1.9 & MR 1.2.1 (f): Tracing log of safety software and parameters changes

- *New requirement 4.10.1.1.6*

4.10.1.1.6 Security related event records (audit records) shall be stored at least 0ve years."

After this preliminary information, the changes in the standard can be examined. This study will concentrate on the main changes introduced in the standard. It will not dwell on editorial changes or on changes made merely so that the subject can be better understood, but will endeavour to concentrate on the changes that affect practice. As stated above, the original texts of the standards prevail and this is only a supporting study.

CHANGES IN THE STANDARD

The new structure of the standard has been built on a common base. The Foreword sections have been changed. Hereafter the EN ISO 8100-1 standard will be referred to simply as 8100-1 and the TS EN 81-20 standard as 81-20. The changes made in the Foreword of 8100-1 are identified below.

"The main changes are as follows:
— requirements for vertically sliding landing and car doors have been added;
— requirements for suspension means other than steel wire ropes have been added;
— requirements for automatic rescue operation have been added;
— requirements for traction lifts with increased available car area have been added;
— requirements for SIL-rated circuits (previously called PESSRAL) have been revised;
— requirements for a working platform in the pit have been added;
— requirements to avoid the dragging of hands (in particular children's hands) in doors have been extended;
— requirements for compensation means entering the refuge space in the pit have been added;
— requirements for the brake have been aligned with overload limits;
— performance and monitoring of the machine brake have been revised;
— requirements for pit access ladders have been revised;
— fire classification of electric cables has been specified;
— requirements for cybersecurity have been added;
— requirements for emergency operation have been revised;
— bypassing normal travel limits in inspection operation has been added;
— SIL levels of the electric safety devices (Annex A) have been revised;
— short circuit between adjacent conductors of travelling cable has been added to electric fault list;
— mechanical strength of luminaires for the well lighting system has been specified;
— requirements for information for use have been revised;
— requirements for tripping the safety gear by electrical means have been added;
— the position of the inspection operation switch has been revised;
— the document structure has been revised as per the ISO/IEC Directives, Part 2. For relationship with this document and ISO
8100-20:2018, see Annex D. ISO/TS 8100-3 provides information on the differences between this document and local standards (ASME A17.1/CSA B44 and JIS A 4307-1/JIS A 4307-2) not included in this document."

INTRODUCTION

The Introduction clause has been changed. Clauses 0.1, 0.2, 0.3 and 0.4 under Clause 0 Introduction of 81-20 have been partly deleted and partly relocated, since they are not directly related to the lift: 0.1 (being a type C standard) has been retained in the Introduction, 0.2.2 (persons and property to be safeguarded) has been taken directly into Clause 1 Scope, 0.4 (assumptions) has been moved to the normative Annex B and to the new Clause 7, while 0.3 (principles) has been deleted entirely. Informative provisions concerning the building interface have thus been removed from Clause 0, but their binding character has not been reduced: Annex B is normative and 7.1 ties this annex to the main text by stating that “building-related boundary conditions shall be in accordance with Annex B”. Part of the assumptions of 0.4, however, has been turned into a mandatory requirement not in Annex B but directly in Clause 4 (e.g. 0.4.21 → 4.1.2).

1. SCOPE

The formal change in this clause is that 1.1, 1.2, 1.3 and 1.4 of 81-20 have been merged and reduced to a single clause. The substantive change is that the scope is limited to “lifts that are indoor or weather-protected”, that is, lifts exposed to outdoor weather conditions (façade/panoramic external lifts) are excluded from the scope. In addition, the requirement for an “enclosed car” has been added to the scope; the hydraulic speed (≤ 1,00 m/s) and pressure (≤ 50 MPa) limits in 81-20, 1.3 b) have changed from grounds for exclusion into technical requirements (4.9.3.8.1 and 4.9.3.5.3.2), and the reference to EN 81-21 has been taken out of the scope. The scope criteria are listed item by item: serving specific levels, having a rated speed exceeding 0,15 m/s, having an enclosed car, moving along guide rails inclined not more than 15° to the vertical, and being indoor or weather-protected. The standard also states explicitly that it does not specify additional requirements for seismic conditions, accessibility, vandalism, use for firefighting and evacuation purposes under firefighters control, faster evacuation of persons with disabilities, or the recall signal in the event of fire. As a direct consequence of this limitation, the wind loads WL which 81-20, 5.7.2.3.8 requires to be taken into account in guide rail calculations do not appear in 8100-1; the term “wind” does not occur anywhere in the text of the standard. Since lifts exposed to the open air fall outside the scope of this standard, wind load calculations for such an installation will have to be carried out separately by specialists.

2. NORMATIVE REFERENCES

Naturally, a great many new ISO and IEC standards have been brought within the normative references. In addition, new versions of the EN references have entered the list. Manufacturers and inspection bodies need to examine these sections with particular care. When inspection forms are prepared, the inspection criteria should be established taking the new standards into account. As this lies outside the scope of the present work, only summary information is given in this section. The new standards should be studied bearing in mind that ISO standards have replaced many of the EN standards previously referred to. Nevertheless, some EN references have been retained (EN 81-28:2022, EN 81-58:2022, the EN 13501 series, EN 50214:2024), while the IEC references have been substantially updated in both number and date.

3. TERMS AND DEFINITIONS

In line with the new structure and its content, some terms have been deleted. The definitions of some terms have been changed and some new terms have been added.

The following definitions have been removed from the standard (the clause numbers are those of 81-20):

- 3.2 Authorized person
- 3.3 Available car area
- 3.7 Competent person
- 3.16 Guide rails
- 3.20 Installer
- 3.23 Laminated glass
- 3.40 PESSRAL
- 3.46 Rescue operations
- 3.50 Safety component
- 3.55 Single acting jack
- 3.56 Sling
- 3.61 Type examination certificate
- 3.62 Unintended car movement

Some of the definitions that are new, or whose content has been changed or re-worded, are given below. As these definitions have not yet been officially translated, no Turkish equivalents are given for them; provisional Turkish renderings have nevertheless been used in the amended clauses so that the changes can be understood.

- carbon fibre reinforced polymer CFRP
- material consisting of carbon filaments and resin
- minimum breaking force MBF
- specified value in kilonewtons below which the measured breaking force is not allowed to fail in a breaking force test
- residual breaking force RBF
- force that the suspension means can withstand at the end of the lifetime
- tension member
- load-bearing structural element (ISO 8100-1, 3.62; that is the whole of the definition given in the standard — the term is used in the context of elastomeric coated steel wire ropes, traction belts and timing belts)
- balancing weight
- mass which compensates all or part of the mass of the car
- counterweight
- mass which compensates the mass of the car and a part of the rated load
- goods passenger lift
- passenger lift with additional measures for the transport of goods
- automatic operation
- operation in which start of the movement of the car happens in response to the momentary actuation of operating devices

- or in response to any other automatic starting function (Note 1 to entry: See Annex E for additional information — Operations overview)
- normal operation
- automatic operation wherein the lift is used for transport of passenger or goods, and wherein the car is stopped
- automatically at the landings (Note 1 to entry: See Annex E for additional information — Operations overview)
- automatic rescue operation
- device or function that operates automatically in case of failure or loss of power supply to move the lift car to a landing
- hold-to-run control device
- control device which initiates and maintains machine functions only as long as the manual control (actuator) is actuated
- mission time
  maximum time interval between manufacturing date and replacement date
- SIL-rated circuit (replaces PESSRAL)
- circuit based on electrical (E), and/or electronic (E), and/or programmable electronic (PE) components with a defined safety integrity level (SIL)

Further new terms may also be added to the list above:
machinery cabinet,
electric safety device (= safety contact, safety circuit or SIL-rated circuit),
power cycle,
PFDavg and PFH

The following terms have also been redefined:
machine room,
stopping accuracy,
levelling accuracy,
positive drive lift
traction lift.
The definitions of these terms are also given in this clause.

81-20 4 LIST OF SIGNIFICANT HAZARDS

This clause has been deleted in 8100-1.

4. SAFETY REQUIREMENTS AND/OR PROTECTIVE MEASURES

The technical content that appears as Clause 5 in 81-20 corresponds to Clause 4 in 8100-1, following the deletion of Clause 4 of 81-20. This is shown in the table below. The clauses beginning with 5 in 81-20 find their approximate counterparts in the clauses beginning with 4 in 8100-1. They are called approximate counterparts because, as a result of some clauses being deleted, some being merged and some new ones being added, not all clauses correspond one to one; nevertheless the order of both standards is built on describing the same equipment. A clause looked for in 81-20 can therefore easily be found in 8100-1. The technical differences are examined in this clause.

5	Safety requirements and/or protective measures	4	Safety requirements and/or protective measures					X	
5.1	General	4.1	General					X	

4.1 GENERAL

4.1.2 Clause 0.4.21 of 81-20 states that the fixing system of guards remains attached to the equipment when the guard is removed. The fixing system of guards shall remain attached to the guard or to the equipment when the guard is to be removed as per the instructions in 6.2.4. What was an assumption (0.4.21) in 81-20 has become a mandatory requirement in 8100-1.

4.1.4 The visibility of labels dealt with in 81-20, 5.1.2 has been rearranged in the new standard; the attributes “indelible, legible, readily understandable, of durable material and placed in a visible position” given in 81-20 have been taken out of the text of the clause, and the language requirement has been moved to a separate clause (4.1.3). The additions have been made that labels shall not become unreadable by use of cleaning agents, oil and grease and shall not be hidden behind parts of the product, excluding enclosures.

4.2 WELL, MACHINERY SPACES AND PULLEY ROOMS

4.2.1.1.1 Whereas 81-20 required the spaces concerned to be reached by authorized persons, the new clause states that they shall be accessible only by use of a key, and the reference to authorized personnel has thus been removed.

4.2.1.2 The pit lighting has been extended to cover the lighting above the pit platform, where provided. In addition, a mechanical strength requirement has been introduced for luminaires, and for fixed luminaires IEC 60598-1:2024, 7.13 level 1 or IEC 62262:2002+AMD1:2021, IK03 and for movable luminaires IEC 60598-1:2024, 7.13 level 3 or IEC 62262:2002+AMD1:2021, IK05 are referenced. The corresponding impact energies in J are given in the table below. It is important that the luminaires to be used in the well are procured in accordance with these standards.

Table 1 – Relation between IK code and impact energy

IK code	IK00	IK01	IK02	IK03	IK04	IK05	IK06	IK07	IK08	IK09	IK10	IK11
Impact energy, J	[a]	0,14	0,2	0,35	0,5	0,7	1	2	5	10	20	50

4.2.1.3.1 An inspection operation switch and a means to control the well lighting are required at the access door to the pit or at the landing door provided with a ladder to enter the pit. The intention is that the lighting and the inspection switch are made operative before entering the pit. The installation dimensions are given in the same clause.

4.2.1.3.2 Where machinery spaces and pulley rooms consist of separate rooms and spaces, a separate socket outlet is now required for each space and room (4.10.7.2). On the lighting side, the 81-20 requirement for a “switch close to each access point” has been relaxed and has become a general switching requirement referring to 4.10.8.2.

4.2.1.4 Alert initiation The 8100-1 standard uses the wording alert initiation instead of alarm. It requires an alert initiation device on the car roof where it is not possible to alert from inside the car, and in the pit or underneath the car where an access door to the pit is not provided. An important change in this clause is that the TS EN 81-28 standard is no longer mandatory. Item a) requires compliance with the TS EN 81-28 standard, **or,** as an

alternative, item b) permits the use of an acoustic device with a sound level of 80 dB(A) at 1,00 m distance, powered by the emergency supply as per 4.10.11 and located on the car roof or at a landing, . This removes the mandatory character of the TS EN 81-28 standard; whoever wishes may apply item b). However, the NOTE under 4.12.3.1 states that national or local regulation can require item a). Furthermore, the reference to EN 81-28 has been updated from the 2003 edition to the 2022 edition.

4.2.1.5 Forces In the calculations to be made under this clause, the expression "compensating ropes/chains" in the definition of P, the mass of the empty car, has been rewritten as "compensation means"; the scope of the definition has not changed. The real innovation in the clause is that the arrangement of 81-20, 5.2.1.8.4, "the floor of the pit shall be able to support the force beneath the guide rail", has been turned into a separate clause in 4.2.1.5.1 reading "the vertical force beneath each guide rail shall be calculated". When the forces acting on the pit are calculated, the value of P shall be established accordingly.

4.2.2 Access to the pit Item b) of 4.2.2.1 sets out the conditions to be met where a pit platform is provided. The characteristics of the access door to the pit and of the ladder, of the access trap door and also of the ladder to access the platform are specified. Where the vertical distance between a door giving access to the pit and the pit floor exceeds 0,50 m, a pit access ladder is explicitly required. Figure 1 gives explanatory illustrations relating to this clause. The addition has been made that, where the falling height below the pit platform is 3,00 m or more, the ladder shall be fitted with a safety cage in accordance with ISO 14122-4:2016, 5.5.1.

4.2.2.2 introduces the requirement that a pit platform shall be provided when the vertical distance from the standing area(s) on the pit floor to the items listed below exceeds 2,20 m, and it defines in detail the characteristics the platform has to meet. It is likewise stated that it shall be slip resistant in accordance with ISO 14122-2:2016, 4.2.4.7 and that it shall bear the warning shown in Figure 2.

4.2.3.2 limits the handling force of the access trap doors on the pit platform to 150 N. This is an entirely new provision; 81-20 had no access trap door on a pit platform, and for the trap doors of machine/pulley rooms it gave no force value but a requirement to be counterbalanced.

4.2.3.3 b) adds a clarification, requiring that access doors, emergency doors and inspection doors be capable of being closed without the use of a key and be automatically locked when closed. In addition, item f) states that a force of 1 000 N evenly distributed over an area of 0,09 m² in a round or square section shall be withstood without elastic deformation exceeding 15 mm.

This is not a technical change: the 0,30 m × 0,30 m area of 81-20, 5.2.3.3 f) has been re-expressed as 0,09 m² (0,30 × 0,30 = 0,09 m²); in both standards the section shall be round or square.

4.2.5.2.2 If the well is partially enclosed, the enclosure shall be located within 0,15 m maximum of the edges of floors, stairs or platforms. The change from 81-20 5.2.5.2.3 d) is that the alternative given there, "…or be protected in accordance with 5.2.5.2.2.2", has been deleted.

4.2.5.2.4 For horizontal beams projecting into the well greater than 0,15 m in width and 0,25 m in length (81-20 had only the 0,15 m width criterion), it has been added that the deflectors forming an inclined surface may show a permanent deformation of 1 mm under a force of 300 N. Previously there was no permanent deformation tolerance, only elastic deformation of not more than 15 mm was permitted.

4.2.5.3.1 introduces the requirement that the horizontal distance between the inner surface of the well and the car shall not exceed 0,12 m over the full height of the well. Previously this distance was 0,15 m.
4.2.5.3.2 defines, in item a) 2), the requirements to be applied where the vertical floor to floor distance is not sufficient. Again here, item b) 1) introduces a permanent deformation tolerance of 1 mm in addition to the 15 mm elastic deformation. Furthermore, as per 4.2.5.3.1 b), the distance shall not exceed 0,15 m throughout the travel on goods passenger lifts in which the landing doors are vertically sliding; previously this distance was 0,20 m.
4.2.5.5.1 Among the protection measures in the well, additional provisions have been introduced for counterweight or balancing weight screens, taking into account the case where a pit platform is provided and the vertical distance between the lowest point of the counterweight/balancing weight and the platform is less than 2,00 m and the horizontal distance between the pit platform edges and the counterweight or balancing weight is less than 0,50 m. Whereas the screen may start at a height of 0,30 m from the pit floor, this distance is limited to 0,10 m for pit platforms. In addition, the requirement in item g), "the screen shall not deflect to cause the counterweight or balancing weight to collide with it when a force of 300 N being evenly distributed over an area of 5 cm² in round or square section is applied at right angles at any point of the screen", has been carried over unchanged from 81-20 5.2.5.5.1 g). The 50 mm distance requirement has not been deleted but moved to a separate clause, 4.2.5.5.3. According to that clause, the car and its associated components shall be at a distance of at least 50 mm from the counterweight. Furthermore, the screen requirement, which was unconditional in 81-20 5.2.5.5.1, is required in 8100-1 only where the above distance conditions are met; this is a genuine narrowing of scope.
4.2.5.5.2 likewise gives additional provisions for partitions between cars. Item b) states that the partition shall not deflect to cause the moving parts to collide with it when a force of 300 N evenly distributed over an area of 5 cm² is applied, and item c) states that the height shall be 2,5 m above the pit floor, above the pit platform and above the top rung of the ladders or steps giving access to the pit. It further states that the width shall prevent access from one pit to another, with the maximum free distance of 0,15 m to the adjacent wall. 81-20 5.2.5.5.2.1 said only that "the width shall be sufficient as to prevent access from one pit to another" and gave no distance (this distance was taken as 0,3 m). In addition, the reference for the 2,50 m height has been moved from "the floor of the lowest landing" to "the pit floor / the pit platform / the top rung of the ladder".
4.2.5.8.1 sets out the conditions to be satisfied where travelling cables are present or compensation means are located in the refuge space provided on the pit floor or on the pit platform, if provided, when the car is at its lowest position. Explanatory graphics have also been added in Figure 8 and Figure 9. Furthermore, 4.2.5.8.1 has added the kneeling posture for pit positions, illustrated as position 3 in Table 3. Whereas 81-20 Table 4 had three types (upright, crouching, laying), ISO Table 3 has four types and "laying" shifts to Type 4.
In 81-20, 5.2.6.3.2.3 required a clear vertical distance of at least 0,30 m above unprotected rotating parts of the machine; this requirement has been deleted. The protection of rotating parts of machinery is covered in 8100-1 by 4.9.1.2 and is unchanged from 81-20 5.9.1.2; 4.5.7.1 relates only to the protection of sheaves, pulleys and sprockets.
4.2.6.3.3 adds the requirement that the distance between part(s) and edges of openings in the slab and the floor shall not exceed 150 mm. The requirement in the same clause for "ferrules, projecting at least 50 mm" has been carried over unchanged from 81-20 5.2.6.3.3.

4.2.6.4.2 introduces the requirement that a clear height of at least 2,00 m be provided at working areas in the well. This height was previously 2,10 m. Machine room heights will now also be required to be 2,00 m. The requirement for a clear horizontal area of 0,50 m × 0,60 m in front of parts where maintenance and inspection are required is not a new clause, but those who try to reach the motor by ladder should take it into account. The issue should be regarded not merely as being able to reach the machine or the motor, but also as finding a working area there (author's note).
4.2.6.4.3.1 requires mechanical devices where maintenance and inspection work on the machinery is to be carried out from inside the car or from the car roof and uncontrolled car movement on the lift is possible. Where uncontrolled car movement is not possible, this requirement is removed. This has to be stated explicitly in the instructions as per 6.2.4.
4.2.6.4.3.2 deals with the condition that inspection doors may be located in the walls of the car: in item b), the 81-20 requirement for a “barrier where the width is greater than 0,30 m” has been replaced by “shall not give access to openings to the well that would allow a ball with a diameter of 0,30 m to pass through”, “automatically locked when closed” has been added to item d), and the reference in item f) has been clarified to require compliance with the requirements for the walls of the car as per 4.4.3.2.2.
4.2.6.4.4.1 Where maintenance and inspection work on the machinery is to be carried out from the pit, mechanical devices are required in cases where uncontrolled car movement on the lift is possible and item g) adds the requirement that the return of the lift to automatic operation shall require intentional reset on site, outside of the well, within a horizontal distance of less than 2,00 m from the door giving access to the pit.
4.2.6.4.5.4 states that for retractable platforms the manual effort for operation shall not exceed 150 N; previously this force was 250 N.
4.2.6.7.2 likewise imposes the 150 mm requirement between the openings facing the well in pulley rooms and the parts passing through them, and, by requiring all sheaves to be guarded, the requirement for a 0,30 m distance above unprotected sheaves has been deleted. As regards protection of sheaves, Table 14 maintains the same approach as 81-20 Table 10: in machine and pulley rooms, nip guards are required as a minimum; and where the rope, belt or chain enters the sheave horizontally or at any angle above the horizontal up to a maximum of 90°, a second device preventing the introduction of objects is also required.

4.3 LANDING AND CAR DOORS

4.3.1.4 When closed, the clearance between door panels, and between panels and uprights, lintels and sills, shall not exceed 6 mm. However, in certain cases smaller clearances are required for glass, mirrored, stainless and steel panels. The conditions for this are given in Table 4. The old standard accepted clearances of 10 mm due to wear; the new standard takes this clearance as 8 mm maximum. Depending on the type of application these clearances may be smaller still. The clause of the standard and the special cases should be examined.
4.3.1.6 requires stops to be provided to prevent hinged landing doors from swinging in the direction opposite to their opening direction, i.e. inside the well. This requirement previously existed only for the car door.
4.3.1.7 makes a flexible part mandatory at the leading edge of the fast panel of vertically sliding doors in order to prevent impact, and its requirements are explained. In item a) the height of the flexible part is given as between 25 mm and 50 mm; in item b) a flexible, non-shearing and non-crushing member to be provided on the leading edge of the fast panel, allowing a minimum compressible clearance of 20 mm, is defined.

4.3.3.3.1 Panels of vertically sliding doors shall be fixed to two independent suspension ropes, chains or belts, and the failure of one of them shall not permit the panel to fall. In the event of a failure of a suspension rope the door shall not operate further.
4.3.3.3.5 Vertically sliding panels shall be counterbalanced so that they will not open or close by gravity, the balancing weights shall be fixed to the supporting system, and the method of fixing shall ensure, by taking adequate precautions, that accidental displacement is prevented.
4.3.4.2 The horizontal distance giving access to the well, that is the horizontal distance between the car door and the landing door, shall not exceed 0,10 m. This dimension was previously 0,12 m. This limit applies in three cases: a) between the leading edges of the car door and the landing doors during their operation cycle; b) between the door uprights at the closing side of side opening doors; c) between the door uprights of vertically sliding doors up to a height of 2,50 m.
4.3.4.3 gives detailed provisions and dimensions for different door combinations. In these cases it shall not be possible to place a ball with a diameter of 0,12 m or 0,15 m, as the case may be, in any gap between the closed doors. These requirements are explained in the clause and are also described in detail in Figure 12, Figure 13, Figure 14, Figure 15, Figure 16 and Figure 17. In this clause, particular attention should be paid to the chamfers required on vertically sliding doors.
4.3.5.2 Horizontally sliding doors and folding doors on the landing and car shall be provided with retainers for keeping the door panel(s) in position if any of their guiding elements fails. Retainers shall be metallic devices, which are either structural parts of the guiding means or part of the door panel or hanger. In 81-20 a retainer was previously only described as a mechanical means. Lower retainers in the sill shall be secured against self-loosening and shall be marked indicating the required engagement with the sill. The pendulum shock test is performed for each panel separately with the upper guiding means in place and the lower guiding means removed, and the door shall resist the pendulum shock test also with the normal guiding means installed. Furthermore, hanger plate retainer(s) shall overlap their counterpart.
4.3.5.3 The point of application of the 150 N manual force was “the most unfavourable point” in 81-20 5.3.5.3.3, whereas in 4.3.5.3 it has been fixed as “at less than 25 mm above the sill level”.
4.3.5.4 expands the provisions for the impact tests, these provisions being given in Table 5. A test procedure has also been added for vertically sliding doors; the procedure is defined in 4.3.5.8 and the striking points are given in Table 6. Figure 19 clearly indicates the striking points for vertically operating doors.
4.3.5.7 The requirement for the marking of laminated glass has changed. The thickness is given in the format xx,y where x is the nominal thickness of each glass panel in millimetres and y the number of interlayers in multiples of 0,38 mm. The marking shall be located at least 25 mm from the edge(s) of the glass panel. The minimum height of the characters shall be 5 mm.
4.3.5.8 Metallic retainers are defined for vertically sliding doors as well, and the requirements they have to meet are defined in detail.
4.3.6.2.1.2 sets out the operating conditions for a power-operated car door working together with a hinged landing door, the necessary requirements being defined in the sub-items. The main principle is that the car door shall only start closing after the landing door is closed, the landing door shall be locked at the latest when the closing

car door has moved 50 mm from the fully open position, and the landing door shall remain locked until the opening car door is 50 mm from the fully open position.
4.3.6.2.2.1 states in item b) 3) that in the case of failure or deactivation of the photocell/protective device, if the lift is kept in operation the kinetic energy of the doors shall be limited to 4 J at their maximum closing speed and an acoustic signal shall operate at any time the door(s) is (are) closing; the sound level shall be adjustable between 35 dB(A) and 65 dB(A) and shall be measured at 1,00 m height at 1,00 m distance from the centre of the door at car and landing side with the doors fully open, item f) lists the requirements for folding car doors, these being shown in Figure 20. If a folding car door is opening into a recess, the recess shall be chamfered with a minimum of 135° and the distance between the outer edge of the door fold and the chamfer in the open position shall be at least 25 mm; or the recess shall be 90° and this distance shall be at least 35 mm. In item h), the force required to prevent a horizontally sliding door from opening shall not exceed 150 N, measured from the fastest panel, excluding the first third of the travel of the door. When this effort is exceeded, the door opening shall be stopped and automatic door movement shall be prevented for at least 20 s. Items j) and k) of this clause are also newly introduced and are important in door manufacture. Item j) states that a test object shall be detected during door opening, or that there shall be a limited gap. The test object and how the test is carried out are defined in Figure 22. Item k) sets out the requirements for the treatment or bending of the vertical hidden edges of the panels of automatic power-operated doors, as well as for the cladding to be applied. These are shown in Figure 21.

4.3.6.2.3 Vertically sliding doors

4.3.6.2.3.1 General
4.3.6.2.3.2 Automatic power-operated vertically sliding doors
4.3.6.2.3.3 Non-automatic power-operated vertically sliding doors
4.3.6.2.3.4 Power-operated vertically sliding doors with sequence operation

Its subclauses examine vertically sliding doors in detail, and the requirements are explained and illustrated in Figure 23 and Figure 24. The details given for vertically sliding doors are substantially expanded new subclauses that replace the single clause in 81-20 5.3.6.2.2.3.
4.3.9.1.1 It is stated that the locking element of each landing door shall be protected to prevent unlocking with a straight round object 300 mm long and with a diameter of 1 mm from the landing side. Previously it only said that it shall be protected, without giving any dimension.
4.3.9.1.4 It is stated that, for hinged doors, locking shall be effected within a maximum distance equal to 10 % of the width of the door panel to the vertical closing edge(s) of the doors, and maintained even in the case of panels sagging. Previously the 10 % figure was not given.
4.3.9.1.6 This clause specifies the application of the force at a height of 1,50 (±0,1) m from the sill level for horizontally sliding doors and folding doors, and on the locking pin for hinged doors. What is new is the definition of the point of application, namely the requirement of 1 000 N applied at a distance not exceeding 0,30 m from the locking element in the case of vertically sliding doors. In addition, item b) introduces the requirement to withstand, irrespective of the door type, the impact of a rigid mass of 4 kg falling in free fall from a height of 0,50 m. Its items likewise set out the requirements for vertically sliding doors and other applications.

4.3.9.1.12 This clause sets out the requirements for flap type locking devices. It states that these locking devices shall only be used for goods passenger lifts. In other words, they cannot be used in passenger lifts. This distinction is defined in 4.3.9.1.1: the locking element is the locking mechanism itself, whereas the locking device is used so as to cover all the door components that perform the locking function. It should not be understood merely as the lock assembly.
4.3.9.3.6 It is stated that, when the car is outside the unlocking zone, it shall be possible to relock the landing door without the use of a tool, including the emergency unlocking key.
4.3.9.3.7 It sets out the requirements for vertically sliding doors where the force to open or to close the door exceeds 300 N. If a force greater than 300 N is required, mechanical or electrical means shall be permanently available on site to keep the manual force within 300 N. The electrical means shall be powered by a supply independent from the main power supply and shall make it possible to open the door within 1 h after main power lost. The force is measured when applied from the landing, the pit or the car roof; if 300 N is exceeded, the means to open the door for maintenance or rescue shall be stated in the instructions.
4.3.9.3.8 It lays down the requirements for the cover behind which the emergency unlocking device is located in vertically sliding doors. This cover shall be self-closing and self-locking, and automatic door operation shall be disabled when the cover is opened.
4.3.9.3.9 It requires the emergency unlocking key to be available at the installation site in the space where the main switch of the lift is located. It also makes a label carrying a warning mandatory.
4.3.12 Where landing doors are fire rated, they shall be closed in automatic operation at the latest after 120 s in the absence of a command for the movement of the car; the information related to door closing shall be provided in the information for use in 6.2.3. Previously no time was given.
4.3.14.1 It is stated that, where the door panels are directly linked to each other and their movements are thereby made interdependent, this linkage is considered as a direct mechanical linkage and therefore does not require the device required in 4.3.13.2 on all panels. The NOTE states that the hanger plate is part of the locking device; previously it was stated that the hanger plate is not considered as part of the guiding means.
Additional conditions for opening the doors by hand have been introduced in 4.3.15.1. Item c) introduces the condition that there is no electrical power to the door operator.

4.4 CAR, COUNTERWEIGHT AND BALANCING WEIGHT

4.4.2.1.1 The expression “available area of the car” has been simplified to “available car area”, the relationship between rated load and area has moved from Table 6 to Table 7, and the term has been removed from the list of definitions in Clause 3. The term “maximum available area” has become “maximum available car area” and is retained in the text of 4.4.2.1.1 and in the title of Table 7.
4.4.2.1.3 In this clause the conditions under which the area between the entrance frame uprights with the doors closed is included in the calculation of the available car area have changed. The situation is described in items a) and b) and shown in detail in Figure 27. The distinction is based on a depth threshold of 100 mm: it is stated that, where the depth does not exceed 100 mm, the area is not included, and where it does exceed it, the total area is included.

4.4.2.2.1 Requirements are defined for goods passenger lifts where the relationship between rated load and available car area is as per Table 7. In item d), the requirement for a mechanical device limiting the downward movement of the car due to loading and unloading to 20 mm has been made unconditional. In 81-20 5.4.2.2.1 b) 4) this requirement applied only where the levelling accuracy was exceeded. Item (f) concerns load monitoring; it is stated that devices satisfying 4.11.2.3, or 4.11.2.4 with SIL 3, may be used for load monitoring. New provisions have been added for hydraulic lifts.
4.4.2.2.2 This clause sets out the requirements for goods passenger lifts where the available car area exceeds the value determined from Table 7. The application of large car areas has been turned from an application for hydraulic lifts only into one covering all lifts, and the necessary requirements have been defined. The subclause items need to be examined carefully in order to satisfy these requirements. Further new requirements have been introduced. SIL 3 has also been added to the load monitoring requirements.
4.4.2.3.3 For goods passenger lifts, a sign at the landing loading areas shall display the rated load with a minimum height of 50 mm for the characters. Previously no dimension was given.
4.4.3.1 c) A provision has been introduced permitting inspection doors to be provided in the car.
4.4.3.2.1 In the requirement that the car floor shall not incline more than 5 % in case of safety device operation, the two cases — the empty car and the car loaded with a uniformly distributed rated load — have been separated into bullet points, and a reference to 4.7.4.1 has been made.
4.4.3.2.3 For car walls made of glass or partly glass, reference is made to ISO 12543-3 for laminated glass.
4.4.4 It is stated that the load bearing structure of the car shall meet the requirements of EN 13501-1:2018, class A1 or A2 or B. EN 13501 has been revised with its 2018 version. In addition, the standard referenced for glass has been changed from EN 12600 to ISO 29584:2015.
4.4.5.1 Projections on the apron shall not exceed 5 mm; recesses have also been added alongside projections exceeding 2 mm, and these are required to be chamfered at least 75° to the horizontal.
4.4.6.2 For emergency doors in the car, a portable bridge is now required where the distance between car emergency doors exceeds 0,20 m (in 81-20 5.4.6.2 the threshold was 0,35 m); the minimum bridge width of 0,50 m and the balustrade requirement have been retained from 81-20, the balustrade has been tied to 4.4.7.4 a), b) and e), and, under a force of 2 500 N over an area of 0,30 m × 0,30 m on the bridge, permanent deformation of 1 mm and elastic deformation of 15 mm are permitted.
4.4.7.2 In this clause, additions have been made in item c) regarding a balustrade on the access side of the car and in item d) regarding the dimensions of the projections into the well. In addition, a balustrade is also required wherever, outside the car roof, there is a place on which a person can stand.
4.4.7.3 To the requirement that openings exceeding 0,30 m between the car and components in the well be closed off at the car balustrade, the 0,30 m opening between components on the car and the wall of the well and components in the well has also been added. This requirement is shown in Figure 29.
In 4.4.7.4, item a) states that the distance between the bars of the balustrade shall not exceed 0,50 m, and item f) adds the requirement that the horizontal distance of

equipment/component(s) requiring maintenance from the car roof shall not exceed 0,70 m from the inside of the balustrade.
4.4.7.5 It is stated that any glass used for the car roof shall be laminated safety glass in accordance with ISO 12543-2:2021, and the markings are required to be made in the manner previously specified.
4.4.8 In this clause the requirement at the point of access to the car roof has changed: 81-20 required a stopping device no more than 1 m from the entry point, whereas 8100-1 instead requires an inspection operation switch at a horizontal clear distance not exceeding 0,75 m; the distance is measured from the inner edge of the landing door sill. The requirement of 0,30 m from a refuge space for permanently installed inspection operation control devices has not changed.
4.4.9 This clause requires ventilation apertures of at least 1 % of the available car area in the upper part of the car and, likewise, at least 1 % of the available car area in the lower part of the car, and the gaps around the doors are accepted as covering no more than 25 % of each of these areas.
4.4.11.1 The restrictions on the use of a balancing weight are defined for positive drive lifts and hydraulic lifts.
4.4.11.3 This clause introduces new requirements and a test method for non-metallic filler weights. The form of the test is shown in Figure 31.

4.5 SUSPENSION MEANS, COMPENSATION MEANS AND RELATED PROTECTION MEANS

4.5.1.1 Requirements for elastomeric coated ropes, belts and elastomeric coated traction sheave grooves have been added for lift suspension means.
4.5.1.2 This clause and its subclauses, 4.5.1.2.1 among them, state that steel wire ropes may be used from a diameter of 4 mm upwards and that they shall either be in accordance with the standard ISO 4344:2022 or comply with the characteristics given in Table 11 and the tests specified in 8100-2.
In 4.5.1.2.2 and 4.5.1.2.3, the characteristics required of the newly defined elastomeric coated materials are defined.
4.5.1.5, 4.5.1.6, 4.5.1.7 and 4.5.1.8 define, respectively, elastomeric coated traction sheave grooves (4.5.1.5), traction sheaves for elastomeric coated steel wire ropes and traction belts (4.5.1.6), driven sprockets for elastomeric coated timing belts (4.5.1.7) and non-metallic replaceable traction sheave groove liners (4.5.1.8). The sheave and sprocket bodies in 4.5.1.6 and 4.5.1.7 are made from steel, cast iron or aluminium; only 4.5.1.8 describes a non-metallic groove or groove liner component.
4.5.2.1 The minimum ratios between the pitch diameter (D) of sheaves, pulleys, drums and sprockets and the nominal diameter (d) of the suspension means are given in Table 12. Particular attention should be paid to the ratios for the newly defined suspension means.
4.5.2.2.1 The requirement has been added that, for elastomeric coated suspension means and for steel wire ropes as per 4.5.1.2.1 b), the MBF shall be verified in accordance with ISO 8100-2:2026, 4.13.4. In addition, a calculation method is given for balancing weights on positive and hydraulic drives. According to Table 12 the minimum D/d ratio for ISO 4344:2022 ropes is 40, and in that case no fatigue lifetime testing is required under Table 13, visual inspection with discard criteria being sufficient; for elastomeric coated suspension means and steel wire ropes as per 4.5.1.2.1 b), however, fatigue lifetime testing in accordance with ISO 8100-2 shall be carried out. Chains are not covered by Table 13.

4.5.2.2.2 gives the minimum safety factors for steel wire ropes as per 4.5.1.2.1 a) without fatigue lifetime testing as per Table 13 and for chains (chains are not covered by Table 13; the value for chains is 10).
4.5.2.2.3 gives the minimum safety factors of steel wire ropes and elastomeric coated suspension means with fatigue lifetime testing as per Table 13.
4.5.2.3.1 refers to Table 13 and sets out the methods for fatigue lifetime testing and monitoring.
4.5.2.3.2 defines the operating conditions that shall apply to the lift once the bending counter and the physical strength monitoring make replacement of the suspension means necessary, together with the reset and the return to automatic operation after replacement.
4.5.2.3.3 and its subclauses describe the bending counter and the calculation of the number of bendings. In connection with this clause, Figure 32 covers the bending counter and Figure 33 gives examples of simple and reverse bending counting.
4.5.2.3.4 sets out the requirements for suspension means physical strength monitoring systems.
4.5.2.3.5 applies only to steel wire ropes of diameter less than 6 mm (4 mm ≤ d < 6 mm). The tool applied to measure the diameter reduction shall be verified in accordance with ISO 8100-2:2026, 4.13.5. It states that the tests shall prove that at a diameter reduction of 6 % related to the nominal diameter the RBF is not less than 80 % of the MBF.
4.5.2.4 The clauses on the connection between suspension means and terminations have been expanded on account of the new suspension means. 4.5.2.4.3 requires the eyebolt connecting the termination to withstand at least 80 % of the MBF after the fatigue test and to be tested in accordance with EN 13411-6:2004+A1:2008, 6.2.5 or ISO 8100-2:2026, 4.13.3.5 (the general 80 % MBF requirement is in 4.5.2.4.1), while 4.5.2.4.4 and 4.5.2.4.5 define the properties required of the terminations of elastomeric coated steel wire ropes and belts.
4.5.3 Suspension means traction/transmission is described more extensively: 4.5.3.1 the car maintained at floor level without slip when loaded to 125 % of rated load, 4.5.3.2 stopping under the emergency braking condition, and 4.5.3.3 the conditions where the car or counterweight is stalled. Steel wire ropes shall be tested in accordance with 8100-2:2026, 4.11, and the tooth strength of elastomeric coated timing belts and sprockets in accordance with 8100-2:2026, 4.13.6.3. Elastomeric coated steel wire ropes and traction belts are also covered by 8100-2:2026, 4.11.
4.5.5 Distribution of load between the ropes or chains is a clause in which the requirements have been defined more extensively and more clearly, taking elastomeric materials into account as well. In addition, 4.5.5.3 introduces the requirement that, for positive drive lifts and hydraulic lifts where a slack suspension means device is used, an intentional reset is necessary before the lift can be returned to service. This requirement applies to both item a) (abnormal relative extension of one of two suspension means) and item b) (slack suspension means) of the clause. In 81-20, 5.5.5.3 this requirement was conditional on “if the risk of slack rope exists” and only the prevention of normal operation was required.
4.5.6.1 In the clause on compensation means, the requirement has been introduced that, for rated speeds exceeding 1,75 m/s, compensation means without tensioning shall be guided above the loop in the straight vertical portion of the compensation means. This requirement was binding in 81-20, 5.5.6.1 d) as well; what has changed is that the guiding location has moved from “the vicinity of the loop” to “the straight vertical portion above the loop”. Elastomeric coated steel wire ropes and belts have also been included among the

compensation means. This change is further explained in 4.5.6.2. In item d) of that clause the ratio between the pitch diameter of the tensioning pulleys and the nominal diameter of the compensation means (D/d) is given by material: at least 30 for steel wire ropes, 24 for elastomeric coated steel wire ropes, 40 for elastomeric coated belts and 150 for elastomeric coated belts with CFRP tension member (81-20 gave a single value of 30). Safety factors are given in 4.5.6.3.

4.5.7 In the clause on protection for sheaves, pulleys and sprockets, where rope retainer pins were previously examined in the same table, the risk of "the ropes leaving the sheaves" that was examined as condition b) in 81-20, Table 10 has been removed from the corresponding Table 14 of 8100-1, and 4.5.7.1 now examines the prevention of bodily injury and the introduction of objects between ropes and sheaves. The case of ropes leaving the sheaves is instead dealt with more extensively in 4.5.7.2, with additional requirements. This clause is illustrated in Figure 35.

4.5.8 has been expanded, and an additional information marking requirement has been introduced for non-metallic pulleys.

4.5.9 The clause Marking of suspension means and compensation means has been added, making it mandatory to mark suspension means and compensation means directly on the coating or on a tag. The marking shall include the name of the manufacturer, the identification, the nominal diameter, the wire tensile strength grade and the MBF, and the minimum height of the characters shall be 2,5 mm.

4.6. PRECAUTIONS AGAINST FREE FALL, EXCESSIVE SPEED, UNINTENDED CAR MOVEMENT AND CREEPING OF THE CAR

4.6.2.2.1.1 In the clause Tripping by overspeed governor — General provisions, subitem a) 3) has been added, giving 1,50 m/s for counterweight or balancing weight safety gears of the captive roller type. This value is not a rated speed but the maximum tripping speed of the overspeed governor: it remains 1,00 m/s for car safety gears of the captive roller type, while for the counterweight and the balancing weight it has been raised to 1,50 m/s.

4.6.2.2.1.2 The maximum distance corresponding to the movement of the overspeed governor rope shall not exceed a) 0,25 m for operating a progressive safety gear; and b) 0,10 m for operating an instantaneous safety gear. Previously 0,25 m between the activation points was considered sufficient.

4.6.2.2.1.7 removes the wording that the overspeed governor "is regarded as a safety component", and verification is now tied to ISO 8100-2:2026, 4.4. The requirement for the type examination certificate number has been replaced by "its identification" in 4.6.2.2.1.8 b) on marking.

4.6.2.2.4.1 In item e) on tripping of the safety gear by rope, it has been added that the electric safety device is permitted to be made inactive within the unlocking zone.

4.6.2.2.4.2 Likewise, in item h) on tripping of the safety gear by lever, it has been added that the electric safety device is permitted to be made inactive within the unlocking zone.

4.6.2.2.5 Tripping by electrical means is an entirely new clause examining the requirements for tripping the overspeed governor by electrical means. This new section needs to be studied carefully. The subclauses from 4.6.2.2.5.1 to 4.6.2.2.5.8 are devoted entirely to this subject. In 4.6.2.2.5.7, on design and verification, the requirements have been introduced that the speed monitoring element and its electric safety device shall be in accordance with 4.11.2.4 (SIL 3) and 4.11.2.1.5, that the electrical part of the tripping element shall be in

accordance with 4.11.2.3 or 4.11.2.4 with SIL 3 and with 4.11.2.1.5, and that it shall be tested and verified in accordance with ISO 8100-2:2026, 4.19.
4.6.3.2 gives the distances at which the rupture valve is to be located from the pit floor and from the working area on the car roof. Previously it was sufficient for it to be accessible.
4.6.4.2 Distances from the pit floor and from the working area on the car roof are given for restrictors as well. Previously it was stated that they had to be accessible.
4.6.5 No fundamental change has been made in these clauses, but there are changes on three points: in 4.6.5.1 the load basis has become the rated load instead of Table 6; in 4.6.5.9 the requirement that the retracted position of the pawl be checked by an electric safety device as per 4.11.2 has been carried over from 81-20, 5.6.5.9, and in addition this device is now permitted to be made inactive within the unlocking zone; and in 4.6.5.10 “the intervention of a competent maintenance person” has been replaced by “intentional reset on site [6.2.4 f)]”, a power cycle by itself not counting as a reset. The hydraulic part has generally remained the same. Some editorial corrections have been made. The arrangement of “supports at two levels” in 81-20, 5.6.5.3 and the requirement to “prevent the car sinking below the landing level by more than 0,12 m” have been deleted; only the requirement to prevent the car from sinking below the lower end of the unlocking zone remains. In 4.6.5.11 it has been added that the electric safety device of the system may be made inactive within the unlocking zone.
4.6.6.1 The scope of the ascending car overspeed protection means now covers a) automatic operation (formerly normal operation), b) emergency operation unless the brake is released as per 4.9.2.3.9, c) emergency electrical operation unless there is direct visual observation of the lift machine or the speed is limited by other means to less than the speed for which the counterweight buffer is designed, and d) inspection operation.
4.6.6.2 The requirement has been introduced that, in the case of using the machine brake, self-monitoring shall be in accordance with 4.9.2.2.2.8.
4.6.6.4 Item c) now states more clearly that it may be used only with suspension and compensation ropes that are of steel.
4.6.6.5 The requirement has been introduced that, for speed reducing elements, the release of the elements as per 4.6.6.4 d) or e) shall be monitored as per 4.9.2.2.2.3 g) (the requirements for monitoring the brake sets).
4.6.6.7 The requirement has been introduced that the return of the lift to automatic operation after the speed reducing elements have operated requires an intentional reset on site.
4.6.6.10 Electrical tripping systems in accordance with 4.6.2.2.5 have been added as a speed monitoring element [4.6.6.10 c)].
4.6.7.1 states that, in lifts without levelling, re-levelling and preliminary operations with doors open as per 4.12.1.4 and where the stopping element is a machine brake as per 4.6.7.3 and 4.6.7.4, any slip due to the traction conditions at unintended movement stopping shall be taken into account for the calculation and/or verification of the stopping distance. The real change in this clause is the recasting of the definition of failure and the removal of the expression “single failure”. The list of exclusions has also been narrowed: the suspension ropes/chains and the drum and chain sprocket failures that were excluded in 81-20 have been taken out of the list, leaving only the traction sheave, sudden loss of traction, flexible hoses, steel piping and cylinder.
4.6.7.3 likewise introduces the requirement that, in the case of using the machine brake, self-monitoring shall be in accordance with 4.9.2.2.2.8.

4.6.7.4 c) The requirement has been added that it may be used only with suspension means of steel wire.
4.6.7.8 has been supplemented with the requirements that, in the case of stopping elements as per: b) 4.6.7.4 d) or e), the release of the stopping element(s) shall be monitored as per 4.9.2.2.2.3 g); c) 4.6.7.4 f), the stopping element(s) shall be monitored as per 4.6.7.3.
4.6.7.9 likewise introduces in this same clause the requirement that, when the means has been activated or the self-monitoring has indicated a failure of the stopping element of the means, the return of the lift to automatic operation shall require intentional reset on site [see 6.2.4 f)].

4.7 GUIDE RAILS

4.7.1.2 A new standard has been designated for guide rails: the reference has been changed to ISO 8100-33:2022.
4.7.1.3 It is stated that guide rails for counterweights or balancing weights without safety gear may either be in accordance with ISO 8100-33 or be made of formed sheet metal. The formed sheet metal option was already present in EN 81-20 5.7.1.3; what is new is the ISO 8100-33:2022 alternative. On the other hand, the requirement “they shall be protected against corrosion” has been deleted from the text of the clause.
4.7.2.1.1. In item b) 4), the requirement to provide the gaps needed to prevent collision of moving parts with other parts has been reworded; and in b) 1) it is now stated explicitly that deflections are to be assessed together with the permissible deflections given in 4.7.5.2. This draws attention in particular to the gaps between moving parts and the machine frames or overspeed governor systems in MRL lifts.
4.7.2.2 states that bouncing scenarios shall also be taken into account in the calculations. These produce significant forces, particularly in high-speed lifts.
4.7.2.3.5 deals with the requirements for guide rails resting on the pit floor and for freely hanging guide rails. Guide rails hanging from the top of the well have been deleted. In addition, for travel heights not exceeding 40 m or for buildings older than 5 years, Fp is permitted to be taken as zero. Fp is the push through force of all brackets at one guide rail line. The “buildings older than 5 years” exemption is new; EN 81-20 had only the 40 m criterion. Furthermore, for freely hanging guide rails the factor 1/3 is now applied not only to Fp but, in accordance with Formula (14), to the sum (Mg · gn + Fp).
4.7.2.3.6 lays down as a calculation rule that, when applying the vertical force on the sill, the car shall be regarded as empty. At cars with more than one entrance, the vertical sill load on the entrance which is causing the highest horizontal force on the guide rail shall be considered. What is new is that the expression “most unfavourable entrance” has been clarified as “the entrance which is causing the highest horizontal force on the guide rail”.
4.7.2.3.7 in the calculations, $k_3 \cdot M_{aux}$ is replaced by F_{aux}, and k_3 is no longer given in the tables. Faux is not exactly identical to k3 · Maux; its scope has been broadened, since it also covers bouncing scenarios. The former impact factor k3 has been removed from EN 81-20 Table 14 and does not appear in ISO 8100-1 Table 18, the bouncing effect having been incorporated directly into F_{aux} itself.
4.7.5.2 What is new among the permissible deflections is item d): for bouncing scenarios the permissible deflection is 10 mm in both directions, including car guide rails. In addition, the limitation “for T-profile guide rails” in the old text has been removed.

In 4.7.5.3, the guide rail calculation is tied solely to ISO 8100-2:2026, 4.10; the options of EN 1993-1-1:2002 and the Finite Element Method (FEM) given in EN 81-20 5.7.4.7 have been deleted from the text.

4.8 BUFFERS

4.8.1.5 Energy accumulation type buffers with linear and non-linear characteristics may be used, under item b), on lifts whose rated speed does not exceed 1,75 m/s, provided that the normal slowdown of the lift is monitored and that buffers for a rated speed of 1,00 m/s are used.

4.8.2.2.1 requires that, when buffer strokes are calculated, either ($0{,}067\ 4 \times v^2$) be taken or, where the slowdown of the lift machine at the ends of its travel is monitored, the speed at which the car/counterweight/balancing weight comes into contact with the buffers. At the same time, the requirement has been introduced that the stroke shall not be less than 0,067 m for speeds not exceeding 1,75 m/s and not less than 0,173 m for speeds exceeding 1,75 m/s. For reduced stroke buffers, EN 81-20 stated that this value could not be less than 0,42 m for rated speeds exceeding 2,50 m/s. In addition, 4.8.1.1 states that the 0,30 m pedestal is not required for the counterweight or balancing weight buffer where a screen as per 4.2.5.5.1 is extended to not more than 50 mm above the pit floor; in 4.8.1.7 the wording that buffers “are regarded as safety components” has been removed and verification tied to ISO 8100-2:2026, 4.5; and in 4.8.1.8 b) “its identification” is required instead of the type examination certificate number, the minimum height of the characters being set at 2,5 mm. The row “Ascending car overspeed protection and unintended movement protection acting on the guide rail, k1 = 2” has also been added to Table 18.

4.9 LIFT MACHINERY AND ASSOCIATED EQUIPMENT

4.9.2.1.1 In item a), belts have been added for traction lifts, with no speed limit imposed; furthermore, in item b) 3), the use of elastomeric coated timing belts with a rated speed not exceeding 1,75 m/s has been added for positive drive lifts.

4.9.2.1.2 states that use may be made of a belt or belts for coupling the motor(s) to the component on which the machine brake (see 4.9.2.2.1.2) operates, whereas previously at least two belts had to be used.

4.9.2.2.2.1 has added that hydraulic cylinders may also be used for the release of the brake. The remainder of the clause defines the properties the hydraulic system has to have. In addition, the requirement for two sets of mechanical components now applies not only to the application of the braking action but also to the parts taking part in the release of the brake; where one set is not working, the load to be held in the downward direction is defined as “the higher of either the rated load or the load corresponding to the overload detection setting”; and where the brake is an element of ascending car overspeed protection or of unintended car movement protection, the mechanical manual release shall be independent for each brake set. Alongside the electromagnet plunger, the cylinder, valve and hydraulic filter have also been added to the definition of a mechanical part.

4.9.2.2.2.3 Item a) has been rewritten: the option of “two independent electromechanical devices (contactors) connected in series” in EN 81-20 5.9.2.2.2.3 a) 1) has been deleted from the text; in its place the options 1) safety circuit as per 4.11.2.3, 2) SIL-rated circuit as per 4.11.2.4 fulfilling SIL 3 requirements, with a PFH ≤ $2{,}5\times10^{-8}$, and 3) directly by the electric safety devices, provided that the current through the switching element(s) is less than half of their rated current, have been introduced. Explanatory parts have been added in the sub-

items, and item f) has added the requirement that, at least where the machine brake is part of the means to stop the car as per 4.6.6, 4.6.7 or 4.12.1.3, an electric device in addition to item a) shall be used and this device shall be able to interrupt the brake current even in the event of failure of the means defined in item a); item g) requires that the release of each brake set shall be monitored, and item h) that means shall be provided to prevent lubricants from the lift machine penetrating the brake linings.

4.9.2.2.2.8 sets out the cases in which the machine brake is used to decelerate the car and introduces the requirement that the machine brake be monitored either by automatic detection of the maximum wear of the brake lining material or by automatic static verification of machine brake holding capability at least once every day of normal operation. It also states what is to be done if a failure is detected, makes a reset arrangement mandatory, and states that, where the machine brake is used to decelerate the car in normal operation, it shall not be used as speed reducing element for ascending car overspeed protection or as stopping element for protection against unintended car movement. In geared machines this means that brakes acting on the high-speed shaft and serving to decelerate the motor cannot be used as ascending car overspeed protection or as protection against unintended car movement. It also covers similar situations.

4.9.2.3.1 defines the characteristics of electromechanical brakes operated by a hydraulic system and states the requirement that a single fault in the means for manual release shall not cause a failure of the braking function.

4.9.2.3.2 states that the instructions for emergency operation shall be fixed on or near the means to operate the machine brake manually. In the case of reduced stroke buffer, the warning sign in accordance with ISO 7010:2019, W001, with a minimum height of 25 mm, supplemented with the text “Reduced Stroke Buffer!” shall be fixed on the same location, and the warning sign is shown in Figure 37.

4.9.2.3.3 deals with the machine brake being manually released under the following conditions: whereas previously the limits (q - 0,1) Q and (q + 0,1) Q were given, the new text reads from 0 % of rated load to (q – 0,1) Q and from (q + 0,1) Q to 100 % of rated load. Previously the balanced condition was addressed, whereas now the unbalanced condition is addressed.

4.9.2.3.9 states that, with the machine brake manually released, the car speed shall be limited to the speed for which the buffers are designed, unless the brake is released mechanically and there is direct visual observation of the lift machine.

4.9.2.5.3 previously described the Ward-Leonard system; since that clause has been deleted, the clause “AC or DC motor supplied and controlled by static elements” (5.9.2.5.4), which already existed in EN 81-20, has moved up one number. Among the methods for removing the power which can cause rotation of the motor, this clause now includes an adjustable speed electrical power drive system with a safe torque off (STO) function fulfilling SIL 3 and PFH ≤ $2{,}5\times10^{-8}$, or a SIL-rated circuit fulfilling SIL 3 and PFH ≤ $2{,}5\times10^{-8}$. The STO option already existed in EN 81-20 5.9.2.5.4 d); what is new is the quantitative target PFH ≤ $2{,}5\times10^{-8}$, the updating of the reference to IEC 61800-5-2:2016, the deletion of the hardware fault tolerance (HFT ≥ 1) requirement, and option e), the SIL-rated circuit.

4.9.3.2.1.2 In the clause on hydraulic buckling calculations, item b) states that the calculations shall be carried out in accordance with ISO 8100-2:2026, 4.15.2.

4.9.3.3.1.1 introduces the requirements that piping and fittings which are subject to pressure (connections, valves, etc.) shall be a) appropriate to the hydraulic fluid used and b) in

accordance with ISO 4413:2010, 5.4.6. Previously no reference was made to a standard. Because a reference to a standard is now made, the requirement for ferrule protection where pipes pass through walls has also been deleted. This subject is now left to ISO 4413:2010, 5.4.6. In addition, the new 4.9.3.3.1.2 requires fittings to be installed in machinery spaces.

EN 81-20 5.9.3.3.2.1 (new: 4.9.3.3.2.1) The requirement that the dimensions and tolerances of the tubes used for the manufacture of rigid pipes shall be according to the applicable standard of the EN 10305 series has been deleted; the reference to EN 10305 has been removed from the standard as a whole, including 5.9.3.2.1.1 c) concerning cylinder tubes.

4.9.3.3.3.2 states that a flexible hose and its couplings between cylinder and non-return valve or down direction valve shall withstand without damage a test with a pressure of five times the full load pressure. The sentence in EN 81-20 5.9.3.3.3.2 that “this test shall be carried out by the manufacturer of the hose assembly” has been deleted from the text; the new text does not specify who is to carry out the test. Although no responsibility is assigned, the marking requirement in 4.9.3.3.3.3 means that in practice the test remains with the manufacturer of the hose assembly. Nevertheless, in accordance with 4.9.3.3.3.3, the name of the manufacturer, the test pressure and the date of the test continue to be marked on the assembly.

EN 81-20 5.9.3.3.3.4 The clause stating that the flexible hose shall be fixed with a bending radius not less than that indicated by the hose manufacturer has been deleted.

4.9.3.4.2 adds to upwards motion d) the electric motor shall be stopped by an adjustable speed electrical power drive system in accordance with IEC 61800-5-2:2016, with a safe torque off (STO) function fulfilling SIL 3 and PFH $\leq 5\times10^{-8}$; or e) the electric motor shall be stopped by a SIL-rated circuit as per 4.11.2.4 fulfilling SIL 3 and PFH $\leq 5\times10^{-8}$. Item d) already existed in EN 81-20 5.9.3.4.2 d); what has changed is the updating of the reference to IEC 61800-5-2:2016 and the setting of the target PFH $\leq 5\times10^{-8}$ in place of HFT ≥ 1.

4.9.3.4.3 Downwards motion has also been rewritten: the options introduced are a) directly by the electric safety devices, provided that the current through the switching element is less than half of its rated current, b) safety circuit as per 4.11.2.3, and c) SIL-rated circuit as per 4.11.2.4 fulfilling SIL 3 requirements with a PFH $\leq 5\times10^{-8}$. The option of “at least two independent electromechanical devices connected in series” in EN 81-20 5.9.3.4.3 a) has thus been removed.

4.9.3.6.1 has been supplemented with the addition that, where a second non-return valve is used for unintended car movement protection (see 4.6.7), the pressure gauge shall be installed between that valve and the down direction valve(s) or the shut-off valve. In 4.9.3.5.3.2 on the pressure relief valve, two separate clauses of EN 81-20 have been merged; an absolute upper limit of 50 MPa has been introduced for the pressure, and for the higher setting of up to 170 % the condition in EN 81-20 “if necessary due to high internal losses” has been deleted.

4.9.3.10.4 has added the requirement that the motor run time limiter shall not prevent the inspection operation (4.12.1.5), the emergency electrical operation (4.12.1.6) and the electrical anti-creep system (4.12.1.10). In addition, in 4.9.3.10.2 b) the limiter's time is now based on “the time to travel the longest distance between adjacent landings” instead of “the full travel”, and in 4.9.3.10.3 “manual reset” has been replaced by “intentional reset on site [6.2.4 f)]”.

4.10 ELECTRIC INSTALLATIONS AND APPLIANCES

4.10.1.1 For electromagnetic compatibility, ISO 8102-1:2020 is required for electromagnetic emissions and ISO 8102-2:2021 for electromagnetic immunity. In addition, the requirement has been introduced that the lift circuits shall comply with the immunity requirements for “all circuits” and for the “safety circuit”, and the standard sets out which of its circuits fall within each of these scopes. (Author's note: examining these circuits makes it possible to determine which circuits are meant by the expressions “all circuits” and “safety circuit” referred to in ISO 8102-2.)

4.10.1.1.4 The maximum permitted temperatures for heat emitting surfaces, according to the locations where they are situated in the lift, are given in Table 20. This table is arranged in five rows: parts which are accessible without the use of a key or a tool, hand-held means of operation, parts intended to be touched but not hand-held, parts which need not be touched, and parts located in the lift well or in the machine room which are marked with the warning sign ISO 7010:2019, W017 (minimum 50 mm); each row gives separate temperature values for metallic and non-metallic surfaces.

4.10.1.1.5 A cybersecurity requirement has been introduced by stating that the lift and the lift components that are capable of connectivity to an external equipment shall be in accordance with ISO 8102-20:2022 Clause 5 and Clause 6. Remote access to, or intervention in, lifts is thereby made subject to defined conditions. The clause states that it does not apply where the external equipment is powered by the main switch as per 4.10.5.1 or by a supply disconnecting device as per 4.10.5.3, or where it is located in a machine room, a pulley room, a machinery cabinet or the well as per 4.2.1.1.1. This means that there is no remote intervention in such cases.

4.10.1.1.6 states that records of auditable events related to safety functions as per Table 25 which are resulting from requirements of ISO 8102-20:2022, 5.5 shall be persistent for at least five years. (Author's note: this provision should also be taken as an indication of what is to be entered in the logbook during maintenance and repair work.)

4.10.1.2.2 in the clause on basic protection, item b) has been changed from authorized personnel to the case where equipment is accessible without the use of a key. The IPXXB requirement in item c) was also present in 81-20, 5.10.1.2.2 c); the reference has been updated from EN 60529:1992 to IEC 60529. Item d), instead of the reference to EN 50274:2002, has been replaced by the IPXXB requirement for enclosures opened for resetting, adjusting or to operate controls.

4.10.3.2.2 introduces additional conditions such as material group, inhomogeneous field and 2 000 m altitude for providing electrical isolation between any adjacent electrical circuits and the electric safety chain.

4.10.5.1.3 states that, where the main switch control mechanism cannot be accessed, without moving the car, from the locations of the control cabinet(s) / the drive control system / the lift machine, an additional device for isolating electrical equipment in accordance with IEC 60204-1:2016+A1:2021, 5.5 shall be provided in addition at the location of that component. The wording has been expanded.

4.10.5.2 the use of a contactor was already an option in 81-20 and remains an option in the new text (“may be used”); the change is the requirement that the device controlling the contactor now complies with IEC 60204-1:2016+A1:2021, 5.3.2 a) to d) and 5.3.3. It has been changed to read that, if the machinery space has several points of access, or if the same lift has several machinery spaces each with its own point(s) of access, the contactor shall be controlled by a device which complies with IEC 60204-1:2016+A1:2021, 5.3.2 a) to d) and

5.3.3. The position of this device shall be checked by an electric safety device as per 4.11.2 or it shall interrupt the supply to the electric safety chain when in off-position. The characteristics of the contactor are specified in the clause.
4.10.5.5 the clause states that a supply disconnecting device in accordance with IEC 60204-1:2016+A1:2021, 5.3.2 shall be provided. The clause is new and applies to two cases: a) any power source integrated in the lift which is supplying circuits having rated voltages exceeding 25 V AC or 60 V DC; b) any power source integrated in the lift which is supplying devices which can cause movement of the car or doors. In 81-20, 5.10.5.5 was a different provision and has become 4.10.5.4.
4.10.5.6 if, after opening of the main switch, some circuits are live and the voltage of these circuits can exceed 25 V AC or 60 V DC, notice(s) located close to the main switch shall indicate this and allow to identify the supply disconnecting device(s) as per 4.10.5.3 and 4.10.5.5. In addition, one of the following options shall be applied for these circuits:
— the conductors of these circuits shall be identified by the colour ORANGE, or
— these circuits shall be separated from other circuits; or
— connections terminals of these circuits shall be identified by warning signs in accordance with ISO 7010:2019, W012. These options have been added.
4.10.6.1.2 For travelling cables, IEC 60245-5:1994, which was one of the three options in 81-20, has been deleted, the reference to EN 50214 has been updated to the 2024 edition, and the material type exclusion has been extended to cover the outer sheath in addition to the insulation (4.10.6.1.2: EN 50214:2024 or IEC 60227-6:2001).
4.10.6.1.3 specifies the fire classification for electrical cables. It states that the minimum fire classification of conductors and cables installed outside enclosures shall be in accordance with EN 13501-6:2018+A1:2022, Class E_{ca} or fire reaction shall be in accordance with the minimum requirements set in IEC 60332-1-2:2025+AMD1:2025, Annex A.
4.10.11.1 sets out explicitly, in nine items (a–i), what the emergency supply is to power and for how long: the emergency light, the intercom system, the acoustic device, holding the machine brake open to allow the car to reach a landing, checking the unlocking zone, the display devices, moving the car, the automatic rescue operation and the electrical means for tripping of the safety gear. The minimum duration for all of the items is 1 h; for the intercom system, at least 15 min of this duration shall be two-way voice communication.
4.10.11.2 The design of the emergency supply shall consider the combined power requirements of all connected devices. A monitoring system shall indicate if the capacity of the emergency supply is less than required. In addition, in 4.10.6.2 the reference for the cross-sectional area of conductors has been updated from EN 60204-1:2006, Table 5 to IEC 60204-1:2016+A1:2021, 12.2.

4.11 PROTECTION AGAINST ELECTRIC FAULTS; FAILURE ANALYSIS; ELECTRIC SAFETY DEVICES

4.11.1.2 has had item k), short circuit between adjacent conductors of travelling cable, added to the failure analysis.
4.11.1.4 states that short circuit between two conductors, when the conductors are insulated for the highest voltage to which any of the conductors can be subjected, may be excluded**.** However, this shall not apply to adjacent conductors of travelling cable.
4.11.2.1.1 SIL-rated circuit(s) as per 4.11.2.4 have been added to the items of the electric safety devices. PESSRAL, which in 81-20 was placed under the safety circuit item (5.11.2.1.1 b) 4) and 5.11.2.6), has thereby become an independent item.

4.11.2.1.4 the following has been added to this clause: the combined reaction time of the electric safety device and the equipment controlling the supply to the lift machine, to initiate stopping of the machine, shall not exceed 1 s.
4.11.2.2.4 the following has been added to the clause: if the degree of protection is less than IP4X (IEC 60529:1989+AMD1:1999+AMD2:2013), the clearances shall be at least 5,5 mm, the creepage distances at least 8 mm and the distances for breaking contacts at least 4 mm after separation.
4.11.2.3.2 the following has been added to the clause: derating (the limitation of the rated value/capacity of a component to a lower value depending on the operating conditions) shall be applied on components of which fault can result to dangerous situation as per 4.11.2.3.3. The response time of the safety circuit shall not exceed 1 s.
4.11.2.3.4 states that a safety circuit where any logic decision or failure detection decision is made using electronic components shall be verified in accordance with ISO 8100-2:2026, 4.6, and that neither safety logic nor failure detection of safety circuit(s) shall contain electronic devices based on computer technology. Electronic solutions based on computer technology (programmable) are thereby taken out of the scope of the "safety circuit" and brought within the scope of 4.11.2.4, SIL-rated circuits. The required minimum safety integrity level is not uniform; it is given in Annex A, Table A.1 as SIL 1, 2 or 3 on a device-by-device basis.
4.11.2.4 SIL-rated circuits
The requirements relating to these circuits are set out in the clauses from 4.11.2.4.1.1 to 4.11.2.4.3.2. 4.11.2.4.1.1 contains the requirement for a minimum safety integrity level in accordance with Table A.1 and a maximum response time of 1 s; 4.11.2.4.1.3 contains the proof test interval of at least 20 years and the PFDavg and PFH limits given in Table 22. In addition, 4.11.2.3.5 requires the name of the manufacturer and its identification on safety circuits, while 4.11.2.4.1.7 requires, in addition to these, the date of manufacturing and the mission time on the data plate of SIL-rated circuits; the mission time shall not be longer than the proof test interval.

4.12 ELECTRICAL CONTROLS

4.12.1.1.3 has had the following added to it: re-levelling, if provided, shall be possible with doors not closed and locked as per 4.12.1.4. There are two changes in 4.12.1.4, the clause on the unlocking zone: the minimum safety integrity level given in Table A.1 for the electric safety device checking the unlocking zone has been raised from 2 to 3; and the requirements in 81-20, 5.12.1.4 c) 1) and 2) concerning the low speed control circuit and the 0,80 m/s check for lifts with manually controlled landing doors have been deleted.
4.12.1.1.5 the requirement has been added that the acoustic signal referenced in 4.12.1.8.3 c) shall be activated for a duration of at least 2 s before any re-start of the lift in automatic operation when stopping was initiated by an electric safety device.
4.12.1.2.2 It states that the overload shall be detected at the latest when the rated load is exceeded by 10 %, and the wording of at least 75 kg has been deleted. This clause affects lifts with a rated load below 750 kg.
4.12.1.2.3 the following has been added to the clause: in the event of overload, an acoustic signal adjustable between 35 dB(A) and at least 65 dB(A) shall be provided. For goods passenger lifts, the acoustic signal shall be adjustable up to at least 80 dB(A). The sound level shall be measured at 1,50 m height at the centre of the door opening when the door is fully open; an optical signal in the car shall be provided, either in accordance with ISO 4190-5:2006, Table C.1 No.7 or as a word "OVERLOAD".

4.12.1.3.2 In the case of reduced stroke buffers, when it is detected by an electric safety device as per 4.12.1.3.1 that the slowdown is not effective before arrival at terminal landings, the return of the lift to automatic operation shall require intentional reset on site [see 6.2.4 f)]. It states that a power cycle by itself shall not provide this reset.
4.12.1.5.1.2 Control interface clause, item a) Rotary control switches shall have a means of prevention of rotation of the stationary member. Friction alone shall not be considered to be sufficient. Item d) in the list is a stopping device as per 4.12.1.11. In the paragraphs following the list, the provisions that it shall be possible to operate the "RUN" push button and a direction push button with one hand simultaneously and that the distance between the "RUN" push button and a stopping device shall not exceed 0,30 m have also been added. At the access door to the well there shall be an inspection operation switch as per 4.2.1.3.1 a) and a means to control the well lighting; at a horizontal clear distance not exceeding 0,30 m of a refuge space there shall be inspection operation control devices without inspection operation switch as per 4.2.1.3.1 b). In 81-20, 5.2.1.5.1 a), a stopping device was required at this location.
4.12.1.5.2.1 explanations and additions have been made in items a), b), c), d) and e), with the relevant clause numbers also given. The inspection door contact and the retraction contacts of the platform are also bypassed. In item f) 4), additions have been made such as: where travel beyond the final limit switches is permitted, automatic stopping on reaching the final limit switches, continuation of travel when the run push button and the direction push button are pressed again, a speed of 0,15 m/s beyond the normal travel limits, and the disabling of the final limit switch and buffer contacts. In general, every clause number mentioned should be looked up and its subclause items examined.
4.12.1.5.3 It states that, unless the return of the lift to automatic operation requires intentional reset outside of the well, the acoustic signal referenced in 4.12.1.8.3 c) shall be activated for a duration of at least 2 s just before the first start of the lift in automatic operation.
4.12.1.5.4 The colours of the inspection operation control devices and the direction of motion arrows are shown in Table 23. The symbol references are given as IEC 60417:2002-5022/5023/2765/2764.
4.12.1.6 Emergency electrical operation clause: in item b), the requirement has been introduced that this be done through hold-to-run control device(s) as per 4.12.1.6.2.3 (with AC-15 / DC-13 contacts, or with at least two devices activated by constant manual force); hold-to-run control switches are made mandatory, any automatic power-operated movement of the door(s) is prevented, manually controlled power-operated closing is required to be performed by a hold-to-run control device, and what the system is to bypass is stated by explicit clause numbers. In subitem d) 2), the requirements have been introduced that, in case of failure or deactivation of the protective devices (photocells), the kinetic energy of the doors shall be limited to 4 J if the lift is kept in operation, and that an acoustic signal adjustable between 35 dB(A) and 65 dB(A) shall operate at any time the doors are closing [4.3.6.2.2.1 b) 3)]. In addition, as per 4.12.1.6.2.1 c) 1), the car speed shall not exceed 0,30 m/s.
4.12.1.8.3 Landing and car door bypass device — in this clause, item b) requires a separate monitoring signal to check that the car door(s) is/are in the closed position (this requirement is carried over from 81-20 5.12.1.8.3 d) and renumbered); item c) states that an acoustic signal at the car shall be activated at least 1 s before movement, shall remain active during movement, and that the sound level of this signal shall be

minimum 55 dB(A) below the car at a distance of 1,00 m**.** In addition, the wording requiring a flashing light below the car to be activated has been deleted.
4.12.1.11 Stopping devices clause: item c) calls for a stopping device in the lift pit below the pit platform if there are moving parts below the pit platform, and item d) at the lift machine, unless another stopping device or a main switch is available at a shortest horizontal clear distance not exceeding 1,00 m. It also contains the wording that this requirement shall not apply when the lift machine is located in the well. Item e) of the list requires a stopping device at the test panel(s) (see 4.2.6.6) when it is separate from the emergency panel; this requirement does not apply if another stopping device is available at a shortest horizontal clear distance not exceeding 1,00 m. Of these, only item c), the exception in d) that it "shall not apply when the lift machine is located in the well" and the condition in item e) are new; conversely, the separate stopping devices in the pit and on the car roof that were mandatory in 81-20 (5.12.1.11.1 a) and c)) do not appear in the new list. The requirement in 81-20 5.12.1.11.2 that "button type devices according to EN 60947-5-5:1997 shall be used" has been removed; all that remains is the requirement that they be bi-stable and such that a return to service cannot result from an involuntary action.
In clause 4.12.1.12 Control of automatic rescue operation, it is stated that the automatic rescue operation shall not make ineffective any electric safety device unless an additional electric safety device provides the same safety function (4.12.1.12.2). In addition, as per 4.12.1.12.3, the car speed shall not exceed the rated speed. Stopping accuracy after a car movement with automatic rescue operation shall be ±20 mm, but re-levelling is not required. If the doors are not closed and the levelling accuracy exceeds 20 mm for more than 3 s, an acoustic signal adjustable between 35 dB(A) and 65 dB(A) shall operate; the sound level is measured at the centre of the car, 1,00 m above the floor. Furthermore, opening of doors during levelling as per 4.12.1.4 is not permitted during automatic rescue operation. Being a new clause, this section is explained in detail in its subclauses and items.
4.12.3.1 Alert initiation device(s) shall be installed in the car. The alert initiation device(s) shall:
a) be connected to a two-way communication system in accordance with EN 81-28:2022; **or**
b) activate an acoustic device with a sound level of 80 dB(A) at 1,00 m distance, located on the car roof or at a landing. The acoustic device shall be powered by the emergency supply as per 4.10.11.
4.12.4 Identification of the software clause: software relevant for safety functions referenced in Table 25 shall be identified.
When replacement of identified software is possible, software version information shall be available on demand. Software version information shall be available in human readable form, either by a built-in system or by an external tool. If this external tool is a special tool, it shall be provided with the lift. NOTE: A laptop or a mobile phone with freely available application is not considered as a special tool.
81-20 5.12.4 Priorities and signals clause has been deleted.

5. VERIFICATION OF THE SAFETY REQUIREMENTS AND/OR PROTECTIVE MEASURES

5.1 Verification methods The technical compliance file requirement in clause 6.1 of 81-20 and the informative Annex B giving guidance on it have been removed; the content of the file has largely been transferred into the instructions in 6.2.2 (Basic data and characteristics). The new definition of verification is given in Table 24. The column heading of Table 24 has changed from "visual inspection" to "inspection", and the footnote definition has been

simplified to “inspection is to verify whether the feature called for by the requirement is present”. Measurement and performance check/test are separate columns in Table 24; they are not included in the inspection column. The former Table 18 has been revised.
5.2.2.2 Items have been added stating that, where one brake set is not working, the remaining brake set(s): a) when the car is travelling downwards at the lower half of the well with rated load and upwards with empty car at the higher half of the well (see 4.9.2.2.2.1), decelerate and **stop the lift machine,** b) hold the car, when the car is loaded with rated load at the lowest landing and with empty car at the highest landing. The test shall be carried out separately for each brake set being released; it is permitted that the car or counterweight make contact with the buffer if the striking speed does not exceed the designed buffer speed. In 5.2.2.1, the requirement has been introduced that the test be carried out at rated speed and with rated load plus 25 % at the lower half of the well, and the requirement in 81-20 6.3.1 a) that “the retardation shall not exceed that resulting from operation of the safety gear or stopping on the buffer” has been removed.
5.2.2.3 The test shall demonstrate that with the machine brake manually released and the car loaded from, see Formula (23):
The carrying out of tests from 0 % of rated load to (q – 0,1) Q and from (q + 0,1) Q to 100 % of rated load, that is, from the empty car up to the balanced load condition, has been added.
5.2.3 In this clause the references for the electrical examination have been updated from HD 60364-6:2007 to IEC 60364-6:2016, and item a) has been expanded to “identification, labelling, coding, colouring, separation, mechanical protections, electrical protections”.
5.2.4.2 The passage has been added stating that with the car empty the counterweight shall be brought into contact with the buffer(s) and the lift machine shall continue to be turned until a) suspension means slippage occurs, or b) the electric safety device as per 4.5.3.3 stops the car before its highest position as per 4.2.5.6.1.
5.2.5 The requirement that the car safety gear test be carried out by turning the machine until slipping or slackening of the ropes occurs has been removed. The passage stating that, after the test, a visual check shall ascertain that no deterioration, except on replaceable friction components, which affects the normal use of the lift has occurred, has been added.
5.2.6 Counterweight or balancing weight safety gear test: it is stated that the safety gear shall be tripped while the counterweight or the balancing weight is descending with empty car at rated speed, and the reduced speeds have been removed. Likewise, the requirement concerning slipping of the ropes has been removed.
5.2.8 In this clause it is stated that, for energy dissipation type buffers, the car with rated load and the counterweight shall be brought into contact with the buffer(s) at the rated speed or at the reduced speed as per 4.8.2.2.1 b); and that, for energy accumulation type buffers, the car with rated load shall be placed on the buffer(s) and the suspension means shall be made slack or the pressure in the hydraulic system shall be reduced to the minimum. What has been removed is only the requirement, for energy accumulation type buffers, to compare the amount of compression with the values in the technical compliance file. The requirement to bring the car with rated load and the counterweight into contact with the buffer for energy dissipation type buffers has been retained.
5.2.12 Ascending car overspeed protection means: where the means requires self-monitoring (see 4.6.6.2), the passage stating that its function shall be checked in accordance with the instructions has been added.

5.2.13 In this clause the verification of levelling has been clarified from “at the most unfavourable landing” to “on the bottom or top floor where the loading/unloading of the car causes the largest change in levelling accuracy”.
5.2.14 In the test for protection against unintended car movement, the requirement to verify that the stopping element of the means is triggered was already present in 81-20 6.3.13; what is new is the removal of the wording “as required by type examination”, the addition of “activation (if applicable)” to the aim of the test, and the introduction of the reference to ISO 8100-2:2026, 4.8.4 c) for the pre-set speed.
5.2.16 Balancing of vertically sliding door (4.3.3.3.5) It shall be checked that a vertically sliding door does not start to open or to close by itself when the door is open with a gap of 100 mm.
5.2.17 Counterweight balance Before performing tests of traction, machine brakes, safety gear, ascending car overspeed protection means and unintended car movement protection means, it shall be verified by machine current measurement or by weighting of the car and counterweight that the counterweight balance is as stated in the instructions.
5.2.18 Balancing weight balance (4.5.3) The requirement has been added that, before performing testing of machine brakes, hydraulic equipment and unintended car movement protection means, it shall be verified by practical testing or measurements that the balancing weight balance is as stated in the instructions.

6. INFORMATION FOR USE

6.2.2 Basic data and characteristics In this clause all subclauses and items point to the relevant clauses, which has increased clarity. Rather than a general description, a detailed list has been drawn up. The main change is that this information, which in 81-20 was required in the logbook (7.3.2), has been transferred into the instructions (6.2.2) in 8100-1, and that clause 6.3 Logbook has been reduced to a single sentence.
6.2.3 Operating information for use In this clause the text has been rearranged because the maintenance-related requirements have been moved into a separate subclause. In addition, a new item a) (operation of the lift from the landing and from inside the car) and item f) (information about the risk of prolonged entrapment in case of failure of alerting) have been added.
6.2.4 Information for maintenance, inspection, repair and periodic checks is given. The reference to the EN 13015 standard has been removed and replaced by the list in this clause. Table 25 is a separate list: as per 6.2.4 w), it indicates whether specific instructions are needed for verification of the safety functions. Maintenance activities have to be organized in accordance with this clause. The scope of maintenance forms should be reconstructed in accordance with this clause. Some of the entirely new items are: k) instructions for SIL-rated circuits, q) methods for performing the tests of clause 5.2 safely, r) discard criteria for non-metallic counterweight fillers, s) bypass devices (4.12.1.8.4), t) protection for maintenance operations (4.12.1.7), u) isolation of electrical equipment (4.10.5.6), v) software (4.12.4) and y) non-metallic groove liners (4.5.1.8). (Author's suggestion: the scopes for monthly, six-monthly and annual maintenance should be defined separately. The standard does not give a period; 6.2.4 a) only requires the content, frequency and procedures to be defined by the manufacturer.)
6.2.5 Information for emergency operation has been made a separate clause and described in detail. Requirements contained in other clauses, and the requirement to identify special tools where any exist, have been brought into this clause.

7. BUILDING-RELATED BOUNDARY CONDITIONS

8100-1 contains a new main clause entitled “7 Building-related boundary conditions”. Clause 7.1 General provisions ties the normative Annex B into the main text by stating that “building-related boundary conditions shall be in accordance with Annex B”; clause 7.2 Plans for the installation in the building governs the installation plans that the manufacturer is to provide for the building.

ANNEX A (NORMATIVE) — LIST OF THE ELECTRIC SAFETY DEVICES AND MINIMUM SIL LEVELS

The “Minimum SIL” column in Table A.1 was already present in 81-20; in 8100-1 the list of devices has been extended and some SIL levels have been reviewed. For example, the minimum level for the check of levelling and re-levelling [4.12.1.4 a)] has risen from SIL 2 to SIL 3; devices such as the check of the main switch (4.10.5.4), the disabling of the bypass (4.12.1.5.2.2), electrical tripping (4.6.2.2.5) and the stopping device below the pit platform [4.12.1.11.1 c)] have been newly added to the list with SIL 3. The table footnote has also become “only relevant for SIL-rated circuits as described in 4.11.2.4” instead of “only relevant for PESSRAL as described in 5.11.2.6”. This table is the practical expression of the transition from PESSRAL to SIL-rated circuits.

ANNEX B (NORMATIVE) INFORMATION ON THE BUILDING-RELATED CONDITIONS IN WHICH THE LIFT IS INSTALLED

The building-related requirements set out in 5.2 of 81-20 and in the informative Annex E (Building interfaces) have been brought together in this annex. The parts not belonging to the lift have thus been removed from the text of the standard and, together with the new Clause 7 (Building-related boundary conditions), have been gathered in this annex. Whereas Annex E of 81-20 is informative, Annex B of 8100-1 is normative; B.2.3 contains concrete values such as an ambient temperature between +5 °C and +40 °C and a noise limit of 80 dB(A) at a distance of 0,50 m.

ANNEX C (NORMATIVE) PIT ACCESS LADDER

C.1 f) a foldable ladder (Type 4b), which is fixed in the pit and then positioned and hooked to the wall of the well. Annex C replaces Annex F of 81-20; the Type 3b ladder of 81-20 (which is laid down on the pit floor for storage) has been deleted, while Type 4 has been split into 4a and 4b. Furthermore, the list of types is no longer an informative option but has become binding (“can be used” in 81-20 F.1, “shall be used” in 8100-1 C.1).

C.2.2 The ladder shall be:

a) able to withstand a vertical force of 1 500 N;

b) able to withstand a horizontal force of 300 N;

c) made of aluminium or steel. The aluminium/steel requirement was already present in 81-20 F.2.2 b); in the new text the wording on anti-corrosion protection for steel and on the prohibition of wooden ladders has been deleted. The value of 1 500 N also existed before, its direction (vertical) having been clarified; the horizontal force of 300 N, on the other hand, is new.

C.3.1 General

The mechanical strength shall be in accordance with ISO 14122-4:2016, Clause 6. This is a change of reference; 81-20 F.3.1 b) referred to EN 131-2:2010+A1:2017, Clause 5. In addition,

in C.3.3 the clear width of the rungs has been changed to 280–600 mm, the rung spacing to 225–300 mm and the flat tread walking surface to not less than 20 mm
C.4 The scope and content of the specific provisions for non-fixed type ladders have been changed (whereas 81-20 F.4 applied only to Type 3 and Type 4, 8100-1 C.4 covers Type 2a, 2b, 3, 4a and 4b): a) the force to handle the pit access ladder has been limited (not more than 150 N for a handling distance D ≤ 300 mm; for 300 mm < D ≤ 700 mm the values in accordance with Formula (C.1): F = 150 − (D − 300)/5), this requirement replacing the 15 kg weight limit in 81-20 F.4 a); e) an additional requirement has been introduced, stating that for ladders Type 3 and Type 4a positioned at the landing door sill there shall be a free distance of at least 0,50 m between the handholds, or between a stile or a handhold and the door frame. Figure C.2 is given for the handling force for movement of the ladder.
C.5 The location of the ladder in the pit is defined, and Figure C.4 is given as an explanatory illustration (Figure C.3, for its part, belongs to C.4 e)). What matters in this subclause is that it gives the clearance dimensions to be complied with for the various types of ladder used in the well. The values are: 0,20 m between the front of the rung and the wall (in 81-20 this was 200 mm, but it was measured from the back of the rung), 0,70 m (previously 800 mm), 0,60 m, and the top surface of the rung being positioned at not more than 0,15 m below the level of the landing sill.

ANNEX D (INFORMATIVE) RELATIONSHIP BETWEEN THIS DOCUMENT AND ISO 8100-20:2018
Table D.1 relates the global essential safety requirements (GESRs) of ISO 8100-20:2018 to the clauses of this document and shows the items indicated as “not covered”. It is a new annex which did not exist in EN 81-20.

ANNEX E (INFORMATIVE) OPERATIONS OVERVIEW
Figure E.1 gives an overview of the types of operation, primarily normal operation and automatic operation; within the text of the standard, reference is made to this annex from 3.2 (automatic operation), 3.36 (normal operation) and 4.12.1.1.

DELETION OF ANNEX B, ANNEX C AND ANNEX D OF EN 81-20
The informative annexes of EN 81-20, “Annex B — Technical compliance documentation”, “Annex C Periodic examinations and tests, examinations and tests after an important modification or after an accident” and “Annex D Machinery spaces – Access”, have been deleted entirely in 8100-1. The deletion of Annex C in particular means that the reference in EN 81-20 7.2.4 a), that “periodical examinations and tests should be carried out in accordance with Annex C”, also disappears, which has direct consequences for the bodies carrying out periodic inspections.

CONCLUSION:
As technology advances and in the light of the hazardous situations encountered, changes to standards are inevitably made. The radical changes introduced this time have brought about significant changes in installation, in manufacture and in inspection alike. I hope that all parties will study the changes to the standard carefully and be ready by the end of the transition period. I wish every success to all members of the sector.

LIST OF REFERENCES

- EN 81-20 Safety rules for the construction and installation of lifts -Lifts for the transport of persons and goods - Part 20:Passenger and goods passenger lifts 2020-03
- 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 2020
- ISO 8100-1 Lifts for the transport of persons and goods —Part 1:Safety rules for the construction and installation of passenger and goods passenger lifts Second edition 2026-03
- ISO 8100-2 Lifts for the transport of persons and goods —Part 2:Design rules, calculations, verifications and tests of lift components 2026-03
- CEN-TC 10-WG 1_N2548_ISO8100_consolidation_presentation_updated_02092025 .pdf European Lift Association
- CEN-TC 10-WG 1_N2599_ISO 8100-1 and 2 correlation tables v2025-12-09.pdf
- EN_ISO_8100-12_Comparison_EN-81-2050_Condensed_Version-9.pdf European Elevator Association, European Lift Association,