



## EN 81-20 AND EN 81-50 – NEW LIFT STANDARDS

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Regulated by the CEN, the European Committee for Standardisation, the standards EN 81-20 and EN 81-50 replace EN 81-1 and EN 81-2 introduced in 1998.

Containing a wide number of standards when it comes to building design, to the safety of service personnel, and to the safety of passenger users, these new standards begin in 31st August 2017 and affect lifts installed after 1st September 2017.

The standard EN 81-20 relates to goods or passenger lift installations and the standard EN 81-50 relates to features of tests, calculations, and examinations of lift components.

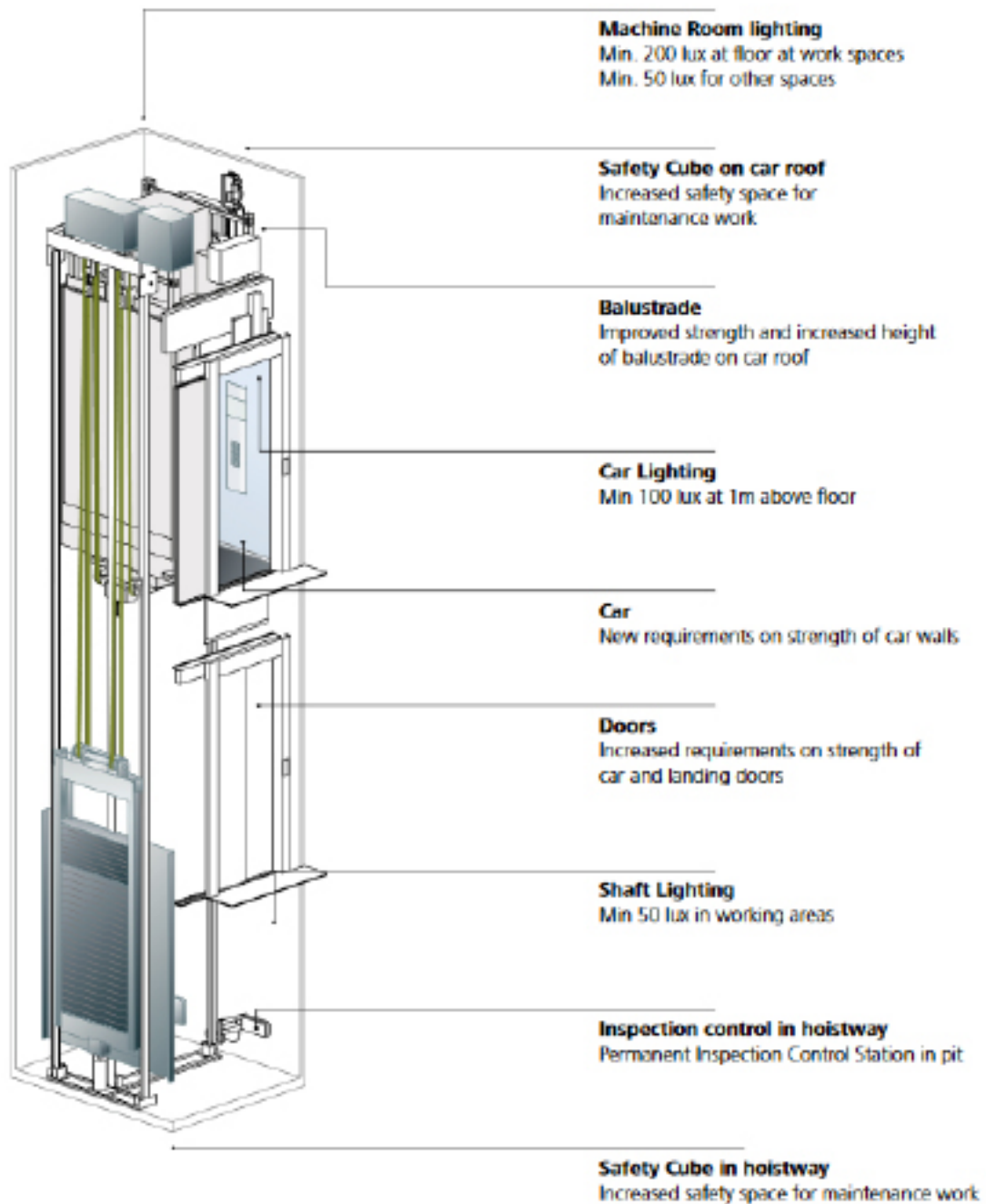
### MAIN CHANGES INTRODUCED WITH EN 81-20 AND EN 81-50

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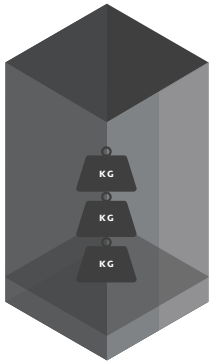
When multiple changes to the standards were made, the affected areas of the lift included main components such as doors, lift cars, shafts, pits, working areas for service personnel, refuge spaces, passenger rescue in case of entrapment, and building design.



## EN 81-20 AND EN 81-50 – NEW LIFT STANDARDS



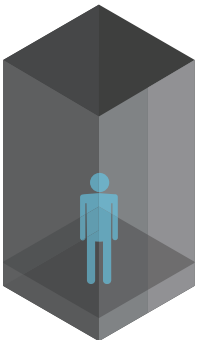
## SAFETY OF SERVICE PERSONNEL



### IMPROVED LIFT STRENGTH

Lifts must now withstand a heavier force in order to increase safety for service personnel. Balustrades must withstand 1000N without elastic deformation of more than 50mm, and the following dimensions:

- When the distance between the balustrade and the wall are between 0.3m and 0.5m, the height of the balustrade must be 0.7m.
- With more than 0.5m of distance between the balustrade and the wall, the balustrade height must be 1.10m.



### CAR ROOF AND REFUGE SPACES

The roof needs to withstand a force of 2000N on an area of 0.3m by 0.3m, without suffering any deformations. With the EN 81-20 standard, a landing door with access to the pit is required, ensuring that engineers can open it from the lift shaft and exit it even when the landing door is closed. When there is a minimum distance of 0.5m from the lift shaft to the well, the balustrade must have 1.1m height.

Service personnel must have an anti-slip working surface and there must be a safety chain protection with the installation of a residual current protected device. An emergency light for the car roof is also needed.

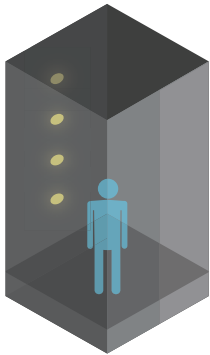


The refuge space for service personnel has been increased:

- 0.5m height and 0.7m x 1m for horizontal dimensions for the lying position for the pit.
- 2m height and 0.4m x 0.5m for horizontal dimensions for the upright position.
- 1m height and 0.5m x 0.7m for horizontal dimensions for the crouching position.



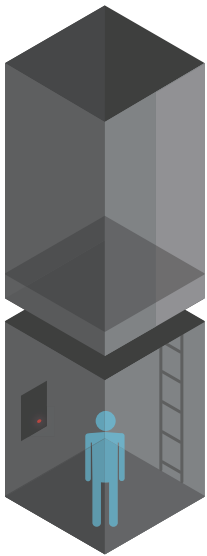
## SAFETY OF SERVICE PERSONNEL



### LIGHTING

For the safety of the service personnel, the EN 80-20 has introduced brighter light requirements for the car, for the lift shaft, and for other areas:

- Lighting in the machine room must be 200 lux.
- There must be 5 lux for an hour in the car roof.
- A minimum of 50 lux for 1m over the pit floor is needed for both working areas and vertically over the car roof.
- Other areas require a minimum of 20 lux.



### LIFT PIT

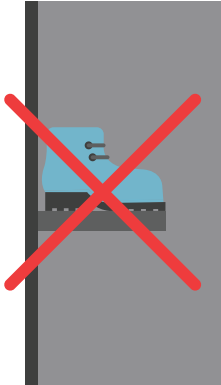
For higher service personnel safety, the lift standards introduce requirements for working and testing in the lift pit. In addition to bigger safety spaces in the pit, there must be a mandatory lift control panel containing a stop button to ensure the service personnel safety:

- An additional emergency stop switch must be present in the lift pit, as well as a control station with audio capabilities and connection in case of entrapment.
- The control station has to be located near the refuge spaces and must include a reset function outside of the lift shaft.
- Optimised controls help to prevent service personnel from having to utilise stools or ladders to reach components under the lift car.

For pits that are deeper than 2.5m, there is an introduction of stricter requirements for safer access. When ladders are installed, they must follow strict location, strength, and dimension requirements. The counterweight screen in the lift pit will also have increased strength.



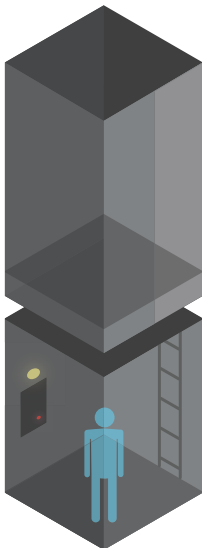
## SAFETY OF SERVICE PERSONNEL



### LIFT SHAFT

When there are horizontal projections, such as ledges of more than 150mm, there must be a protection installed to prevent people from stepping on them, with exception to:

- Ledges around the pit when there is a partially enclosed lift shaft.
- Car roof balustrades of more than 150mm as well.



### LIFT CONTROLLER

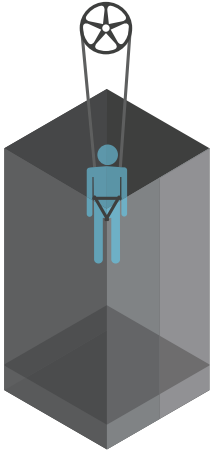
There must be an RCD for separate 230v circuits and LED lighting to guarantee that the working area has the required lux levels and the appropriate conditions for lift servicing:

- A fault monitoring system will ensure lift car safety edges and a safety circuit will monitor the door motor for overheating.
- To guarantee an inspection speed of 0.3m/s, a shaft switch needs to be installed.



## SAFETY OF SERVICE PERSONNEL

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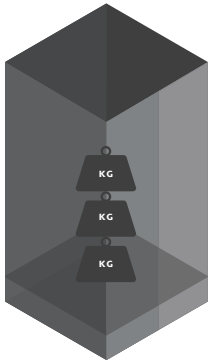
### PASSENGER RESCUE

There are new, set dimensions for the rescue of passengers and the safety of lift service personnel to ensure there is no entrapment when rescuing passengers:

- Inspection doors must have a maximum of 0.5m of width and height.
- Emergency doors must have a minimum of 1.8m of height and a minimum of 0.5m of width.
- Trap doors require a minimum of 0.8m per 0.8m.
- Pulley room access doors need a minimum of 1.4m of height and 0.6m of width.
- Shaft and machine room access doors need a minimum of 2m of height and 0.6m of width.



## SAFETY OF LIFT PASSENGERS



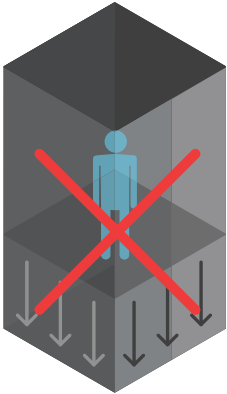
### IMPROVED LIFT STRENGTH

With the EN 80-20 standard, lift strength requirements cover all aspects of the lift, such as the wall, the car, and the landing door.

If composed of full or partial laminated glass, the walls need to be able to withstand a shock of 10kg for a rigid pendulum with a drop height of 0.5m, and a shock of 45kg with a soft pendulum with a drop height of 0.7m. The walls and doors need to be resistant to applied forces:

- The walls of the lift must withstand 1000N without any permanent deformation of a minimum of 1mm and without elastic deformation of a minimum of 15mm.
- Doors also need to withstand 1000N without permanent deformation of a minimum of 10mm.
- The doors need to withstand 300N without permanent deformation of a minimum of 1mm and without elastic deformation of a minimum of 15mm.

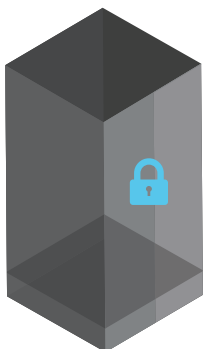
## SAFETY OF LIFT PASSENGERS



### UNINTENDED CAR MOVEMENT AND SAFETY

The new standards introduce new requirements regarding unintended car movement, in order to avoid serious injury. Vital for rescue operations, the ascending car overspeed has been extended. For passenger safety, there is also an added prevention measure to ensure the car doesn't move from the landing. The door detection mechanism prevents the doors from closing when they are obstructed and from being opened outside of the unlocking area:

- To detect small objects, photoelectric sensors with increased sensitivity are to be installed by the lift car's entrance.
- To prevent the doors from being opened from the inside, a locking mechanism needs to be installed. The doors also need to lock outside of the unlocking zone to prevent passengers from falling into the lift shaft.



### EVACUATION

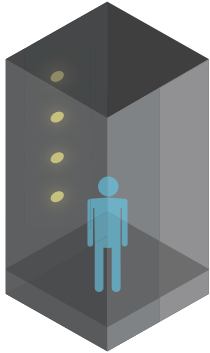
There must be a car door opening restrictor and the car door must be unable to be opened from inside when the lift is outside of the unlocking zone to prevent a fall due to self-rescue. For evacuations, there are new guidelines for the safety hatch and toe guard:

- The roof safety hatch must have the dimensions of 0.4m x 0.5m for a safe evacuation of passengers.
- The toe guard must withstand 300N without permanent deformation of a minimum of 1mm and elastic deformation of a minimum of 35mm.





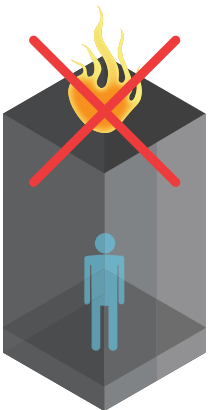
## SAFETY OF LIFT PASSENGERS



### LIGHTING

Lighting in the car has seen an increase with the new lift standards:

- The minimum lux has increased to 100 from 50 in the car.
- The emergency lighting must have 5 lux for one hour and 1m height in the centre of the car, near the emergency push buttons.



### LIFT MATERIAL FOR FIRE RESISTANCE

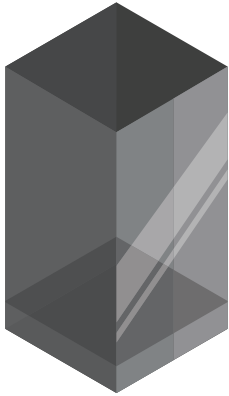
According to EN 13501-1 requirements, the standard EN 81-20 has introduced stricter fire safety requirements for materials. For ceilings, floors, and walls, the classifications of 'C' and 'Cl' refer to reaction to fire and the classifications of 's' and 'd' refer to materials when it comes to smoke and the formation of both flaming droplets and particles:

- For ceilings, the classifications are 'C', 's2', and 'd0'.
- For floors, the classifications are 'Cfl' and 's2'.
- For walls, the classifications are 'C', 's2', and 'd1'.



## BUILDING DESIGN

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Introduced by EN 81-20:2014, building designers have new requirements to ensure that the shaft walls must withstand 1000N. When the building is being designed, the designer has to account for the proper ventilation of the lift shaft and the following:

- Glass utilised in the lift shaft must be laminated.
- The shaft must also have a fire extinguisher, the sprinklers need to activate when the lift is stationary at landing position, and the lighting circuits need to turn off.
- Building shrinkage needs to be taken into consideration in lift design for higher ride quality. This requirement applies to buildings higher than 40m, in which the ride distance is more than 40m.