

A man and a woman are walking through a modern glass entrance of a building. The man is on the left, wearing a light-colored sweater and dark trousers, looking towards the camera. The woman is on the right, wearing a dark blue coat and light blue trousers, walking away from the camera. The entrance features a glass door with a black frame and a glass panel with a logo. A large blue circle is visible in the top left corner of the image. A green exit sign is mounted on the wall above the entrance. A potted plant is visible on the left side of the entrance.

DESIGNING DOORS FOR YOUR BUILDING

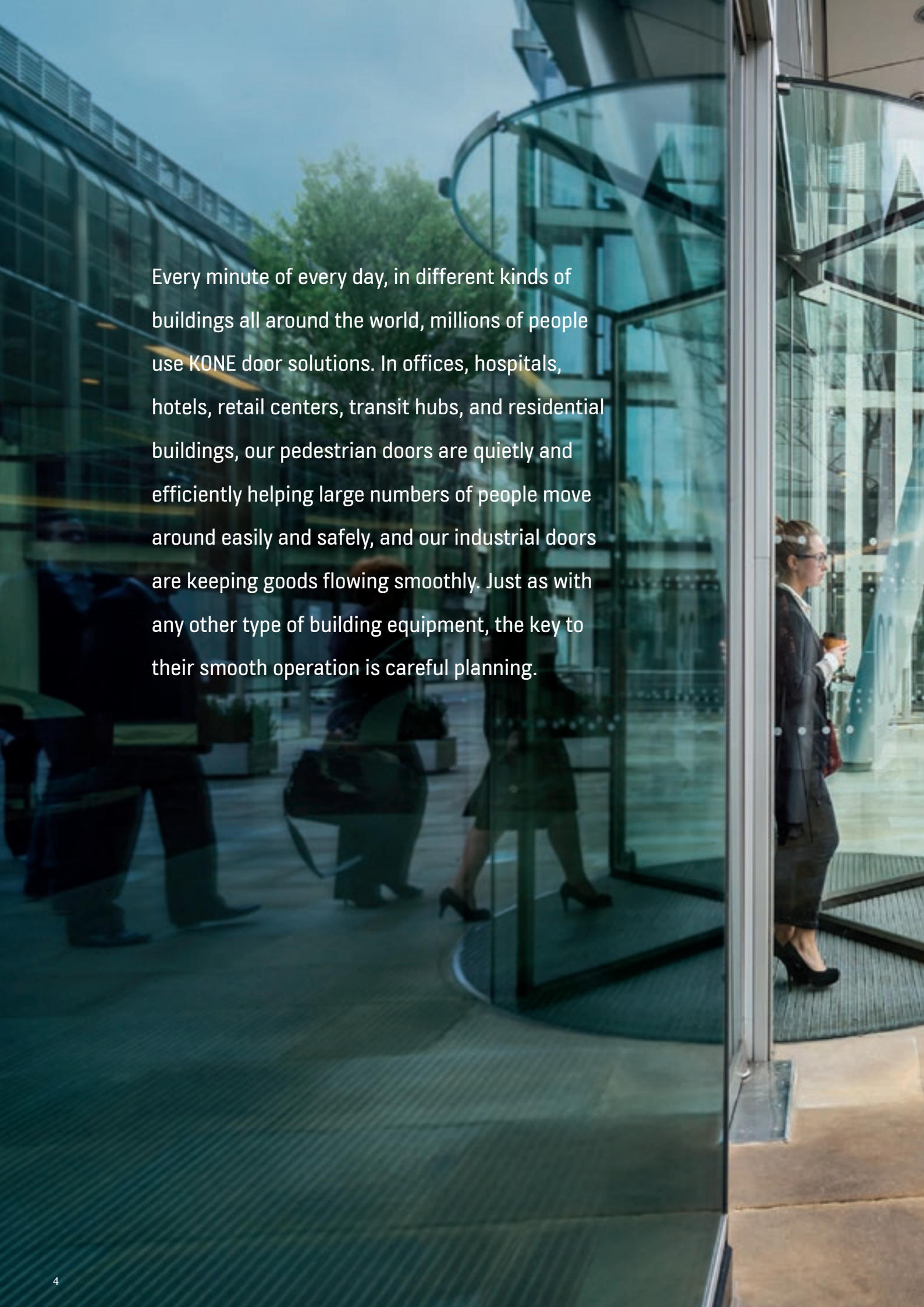
A handbook for architects

TABLE OF CONTENTS

WELCOME TO THE HANDBOOK	4
HOW TO USE THIS HANDBOOK	6
HOW WE MEET YOUR NEEDS AT EACH KEY STEP	8
OPTIMIZING PEOPLE FLOW IN YOUR BUILDING	9
UNDERSTANDING THE UNIQUE REQUIREMENTS OF DIFFERNT BUILDING TYPES	11
MEDICAL BUILDINGS	12
OFFICE BUILDINGS	14
RETAIL BUILDINGS	16
INFRASTRUCTURE BUILDINGS	17
HOTELS	18
RESIDENTIAL BUILDINGS	19
THE KONE BUILDING DOOR OFFERING	20
KONE REVOLVING DOORS	21
KONE SLIDING DOORS	22
KONE SWING DOOR OPERATORS	23
KONE GLIDING DOORS	24
KONE HERMETIC DOORS	25
KONE TURNSTILES	26
KONE SECTIONAL OVERHEAD DOORS	27
KONE HIGH-SPEED DOORS	28
KONE ROLLER SHUTTERS AND GRILLES	29
A DEDICATED PARTNER	30
AWARD-WINNING DESIGN	31
SUSTAINABILITY	32
SAFETY AND MAINTENANCE	33
APPENDIX	34







Every minute of every day, in different kinds of buildings all around the world, millions of people use KONE door solutions. In offices, hospitals, hotels, retail centers, transit hubs, and residential buildings, our pedestrian doors are quietly and efficiently helping large numbers of people move around easily and safely, and our industrial doors are keeping goods flowing smoothly. Just as with any other type of building equipment, the key to their smooth operation is careful planning.



WELCOME TO THE HANDBOOK

Dear reader,

We aim to provide our customers with a performance edge by offering the best user experience in the rapidly developing urban environment. Our innovative people flow solutions help people and goods move within and between buildings smoothly, safely, comfortably, and without waiting.

Doors provide the first and last impression of any building, and our solutions make sure that these impressions are always positive. They also serve many purposes beyond just providing access for people and goods and acting as a design feature – including insulation, fire protection, access control, and contamination prevention. Furthermore, they can incorporate features that support goals such as energy efficiency. Our doors work in harmony with the wider KONE offering – including elevators, escalators, and turnstiles, as well as intelligent solutions for access and destination control, communication, and equipment monitoring. This means KONE can provide everything you need for your people flow needs. Together, our solutions ensure that, whatever your building type, the people and goods flow will be safe, secure, and smooth.

This handbook is intended to be a clear, easy-to-understand introduction to the main process stages, from initial planning to choosing the right door solutions for your project. It will help you to select the correct solution for each specific application, recommend ways to optimize people flow, and introduce essential door-related requirements for specific building types. It also briefly introduces our door offering and points you to the wealth of useful information and handy tools available on our website, [KONE.com](https://www.kone.com). Should you have any further questions, your local KONE representative will be happy to help.

Sincerely,

Antti Ruutu
Head of Doors Business
KONE

HOW TO USE THIS HANDBOOK

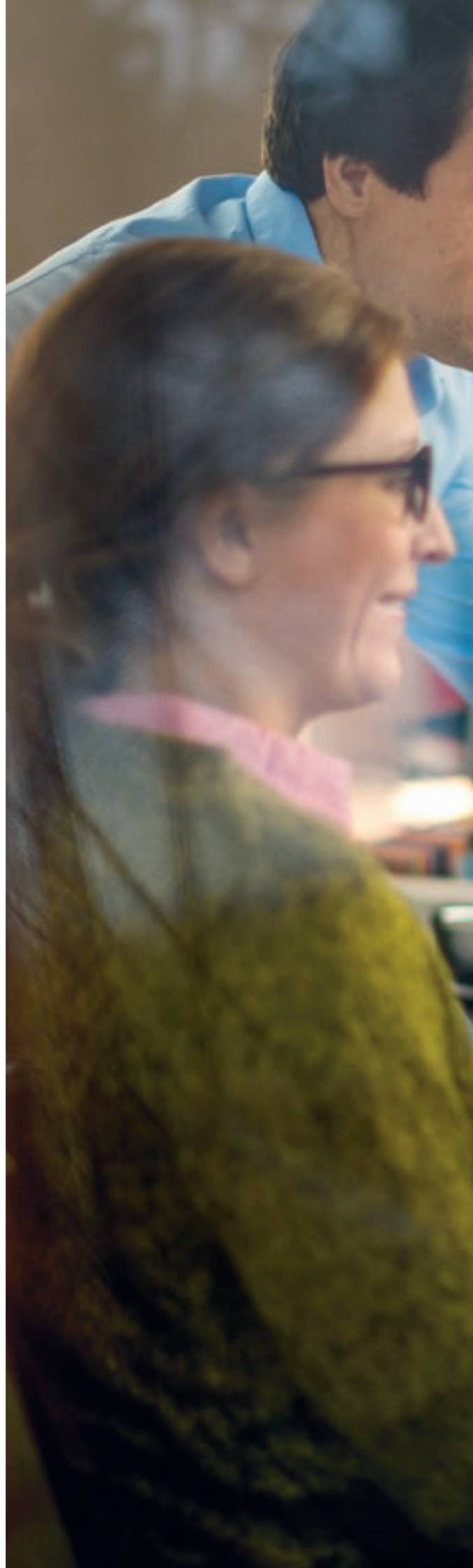
This handbook is intended to give you a taster of what to consider when planning people and goods flow solutions for your projects.

The initial sections deal with the issues you need to consider during planning, solution selection, and specification in order to optimize people flow within your building. This is broken down by building type to make it easier for you to find what you're looking for.

The later sections cover our different types of door solutions and their main features, as well as the relevant safety standards to consider in relation to building doors. For product-specific information, check the product segment matrix on page 11, where you can quickly check which KONE products we recommend for different building types.

Finally, there is a brief overview of the support we can provide for every stage of the equipment life cycle, from planning and installation to maintenance and modernization.

The latest information about KONE door solutions and the rest of our offering – including elevators, escalators and autowalks, People Flow Intelligence solutions, and our tailored maintenance and modernization services – can be found on our website, [kone.com](https://www.kone.com). If you are using a printed copy of this handbook, it's also where you can download the latest version. The digital version includes the most up-to-date information on our products and services.





ITEM	QTY	UNIT	DESCRIPTION
1	1	EA	DOOR
2	1	EA	WINDOW
3	1	EA	WALL
4	1	EA	FLOOR
5	1	EA	CEILING
6	1	EA	ROOF
7	1	EA	FOUNDATION
8	1	EA	STRUCTURE
9	1	EA	MECHANICAL
10	1	EA	ELECTRICAL
11	1	EA	PLUMBING
12	1	EA	PAINT
13	1	EA	LANDSCAPE
14	1	EA	INTERIORS
15	1	EA	EXTERIORS



PROJECT INFORMATION	
PROJECT NO.	123456
CLIENT	ABC COMPANY
DATE	10/20/2023
LOCATION	123 MAIN ST, NEW YORK, NY
DESIGNER	XYZ ARCHITECTS
SCALE	1/8" = 1'-0"
NOTES	
1. ALL DIMENSIONS ARE IN FEET AND INCHES.	
2. SEE OTHER SHEETS FOR DETAILS.	
3. MATERIALS TO BE DETERMINED BY ARCHITECT.	
4. CONSTRUCTION METHODS TO BE DETERMINED BY CONTRACTOR.	
5. ALL WORK TO BE IN ACCORDANCE WITH LOCAL AND NATIONAL CODES.	

HOW WE MEET YOUR NEEDS AT EACH KEY STEP

PLANNING

1

THE FIRST STEP WHEN PLANNING BUILDING DOORS INVOLVES LOOKING AT THE WHOLE BUILDING PEOPLE FLOW HOLISTICALLY, INCLUDING:



- Analyzing the floor plan and sections of the building
- Analyzing the people flow needs according to the type and specific characteristics of the building
- Where possible, checking traffic capacities (the volume of people each door is expected to handle) together with the traffic capacities of any other equipment in the building, such as elevators, escalators, and turnstiles



- Planning integration of doors and other equipment (for example using KONE People Flow Intelligence solutions) to help people move around the building smoothly while maintaining security
- Developing a complete understanding of your building's requirements
- Giving you an overview of the typical door solutions according to building type
- Defining preliminary dimensions



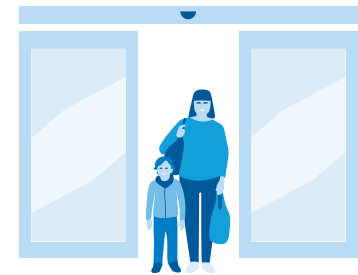
SELECTION

2

THE NEXT STEP IS TO DEFINE THE RIGHT DOOR SOLUTIONS FOR YOUR PROJECT (SEE PAGE 11). THIS IS DETERMINED BY:



- The different characteristics of pedestrian and industrial doors
- Product recommendations according to the standards and building (segment) requirements, such as security, environment etc.



SPECIFICATION

3

THE FINAL STEP IS TO SPECIFY THE REQUIRED DIMENSIONS FOR THE DOOR SOLUTIONS, IN ORDER TO COMPLETE THE BUILDING'S SPECIFICATION BOOK. THIS INVOLVES:



- Clarification of interfaces with other equipment in the building and with the building itself
- Checking the requirements of local standards and regulations for issues like safety and fire protection
- Technical drawings (AutoCAD/BIM models)
- Defining final installation dimensions



OPTIMIZING PEOPLE FLOW IN YOUR BUILDING

UNDERSTANDING PEOPLE FLOW NEEDS

People flow is all about how people move within and between buildings, and in an increasingly urbanized world where city populations are rising rapidly, it's more important than ever. KONE door solutions are an integral part of our vision to offer the best people flow experience by helping people move around smoothly, safely, comfortably, and without waiting while ensuring high-quality accessibility for all.

People flow is analyzed and planned based on several parameters, the most important of which is the total journey time, defined as the time taken to travel from the building's main entrance to the destination. The total journey time can be divided into horizontal and vertical dimensions.

For horizontal traffic, there are parameters such as usage of space, dwell time, and crossing flows or paths. Elevators are the core element of the vertical dimension in any high-rise building.

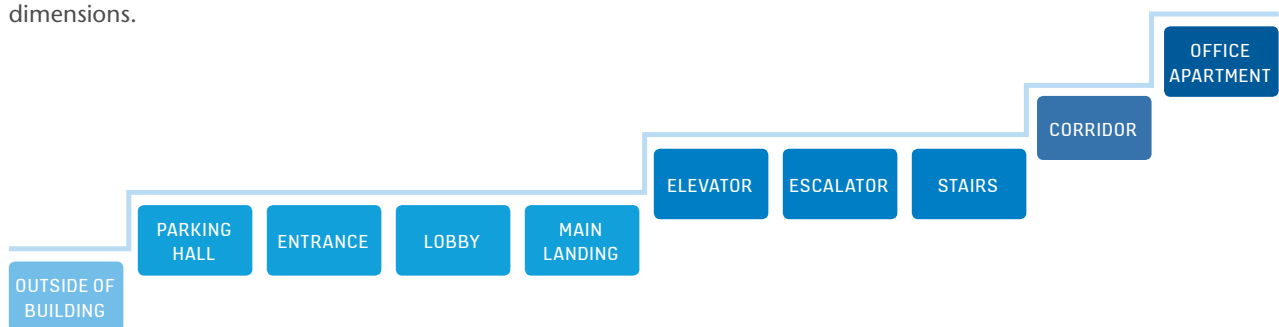


Figure 1. A typical user journey in an office building

KONE understands people flow from different perspectives:

PEOPLE AND GOODS

Focusing on the movement of both individuals and larger crowds of people, as well as goods

PROCESSES

Understanding how the building as a whole is used throughout its life cycle

PERFORMANCE & APPLICATION

Understanding our customers' challenges and offering the most appropriate solutions for them and their end users

SELECTING PEDESTRIAN DOORS

Doors can be used to separate the various user and goods flows within a building. Location of doors and correctly selected door solution help minimize cross flows and ensure smooth, safe movement for all.

The location, type, dimensions (width or diameter and height), and operating speed of a door solution influence user behavior and have a direct impact on door capacity. Table 1 gives some examples of factors that you should consider when choosing pedestrian doors.

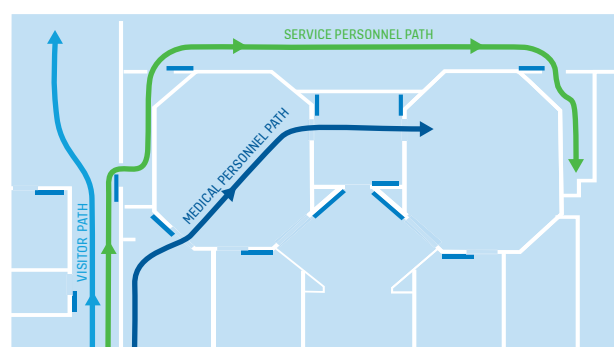


Figure 2. Example: different user paths in hospital environment

1. User experience	<ul style="list-style-type: none"> Who are the building's main user groups? Pay particular attention to people with restricted mobility and elderly. Is the building population stable, or will it change often over time?
2. Cultural factors	How do end-users perceive personal space and queuing behavior?
3. Available space	<ul style="list-style-type: none"> How critical is to save space in each concrete case (see Figure 3)? What space is required for particular door type installation?
4. Design elements and layouts	<ul style="list-style-type: none"> Does building design channel people to or away from the doors? Are there any areas that cause distractions or cross flows (restaurants, security measures, lounges, and multiple entry or exit points)?
5. System integration	Is integration of doors, elevators, and an access control system needed?
6. Size and number of doors	Is there risk of traffic bottlenecks? Size and number of doors impact energy flow (hot and cold air) into and out of the building or floor and control draft in the building
7. Door operation	Automatic and manual doors have different implications for safety, security, traffic flow, comfort, and hygiene (See also 1. User experience)
8. Door type	Impacts flow optimization, eco-efficiency, and the security of the building, as well as planned architectural design
9. Door leaf operation and speed	Sliding doors can typically operate faster than swing doors
10. Uni or bi-directional travel	One-way traffic capacity is higher than two-way; for example, sliding vs. swing doors
11. Door installation method	In-wall installation can be more space-efficient than on-wall installation
12. Special features	Location of doors on escape routes; fire resistant and burglar-proof features
13. Guidance	Visual appearance of doors can help guide people to their desired destination

Table 1. Factors to consider when selecting pedestrian doors

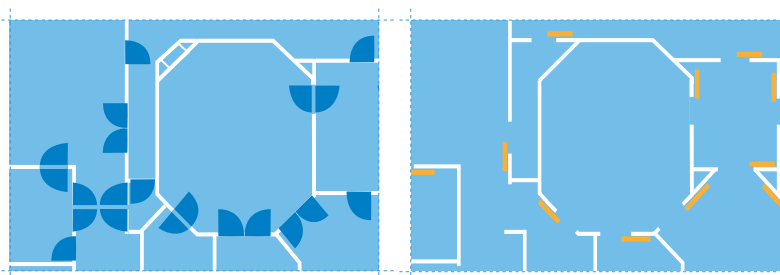


Figure 3. Sliding vs swing doors can save up to 15 % of space based on opening area that swing door requires

SPACE EFFICIENCY INSIDE THE BUILDING

Doors can contribute to smarter usage of the space in the building in several ways:

- Certain door types can save more space than others. For example, sliding doors are up to 15% more space efficient than standard swing doors, which require 1.5–2 m² of floor space for opening (see Figure 3).
- Particular door types can reduce the risk of collision with moving objects and people (see Figure 4).

SELECTING INDUSTRIAL DOORS

Industrial doors vary in terms of space needed for installation, their construction materials, insulation and sound properties, opening and closing speed and required accessories. The most common types of industrial doors are sectional overhead doors, roller shutters, grilles, and high-speed doors.

When planning a building that will include industrial doors, it is essential that you take into account the following parameters as early as possible in the design process:

- Is the door external one or for internal application?
- Maximum size of the opening (width, height)
- Heat transmission (U-value: W/m²K)
- Air leakage or air permeability
- Air infiltration, which is dependent on the opening and closing speed (m/s)
- Power consumption (stand-by power, W)
- Draft-prevention needs
- Headroom
- Door installation depth
- Environment (doors equal and over 2500 mm require equipment for working at height)

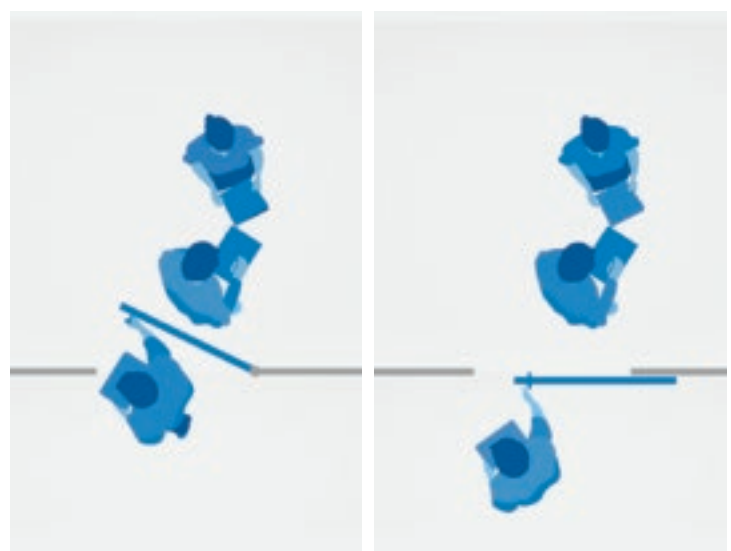


Figure 4. Sliding door reduces the risk of collision

UNDERSTANDING THE UNIQUE REQUIREMENTS OF DIFFERENT BUILDING TYPES

Although building types can be loosely categorized into medical, office, infrastructure, residential, retail, educational/leisure and hotel segments each and every building has its own unique people flow transportation requirements. The following sections of this handbook will take you through the key requirements to consider when selecting door solutions for different types of buildings.

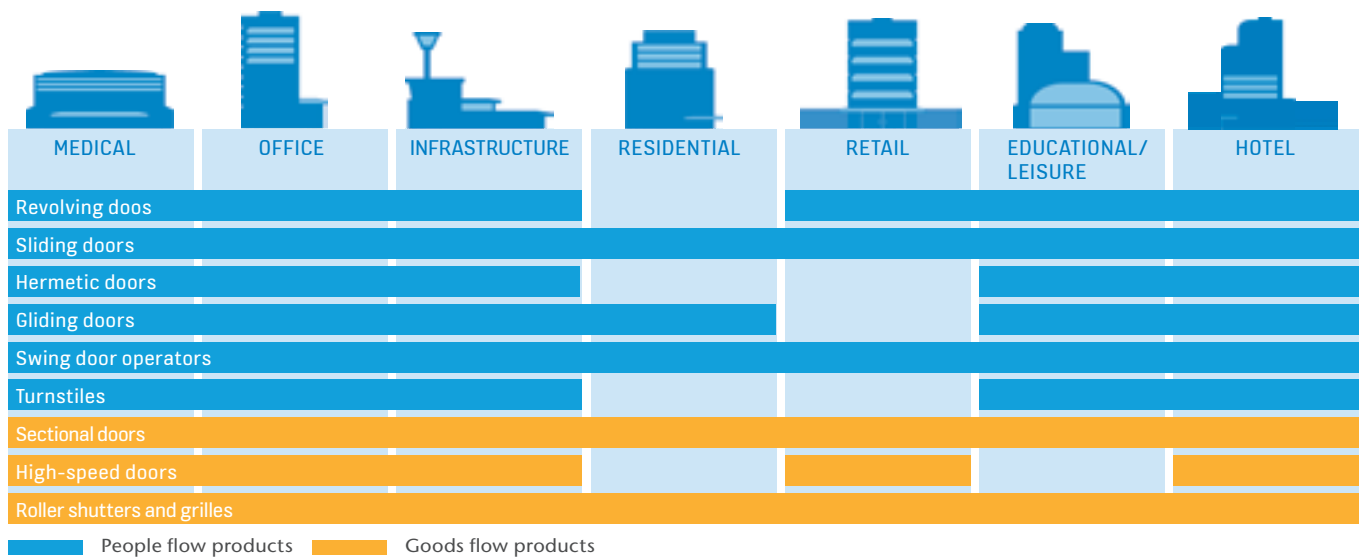


Figure 5. Product-segment matrix

For more detailed information and to access our easy-to-use doors toolbox, visit kone.com.

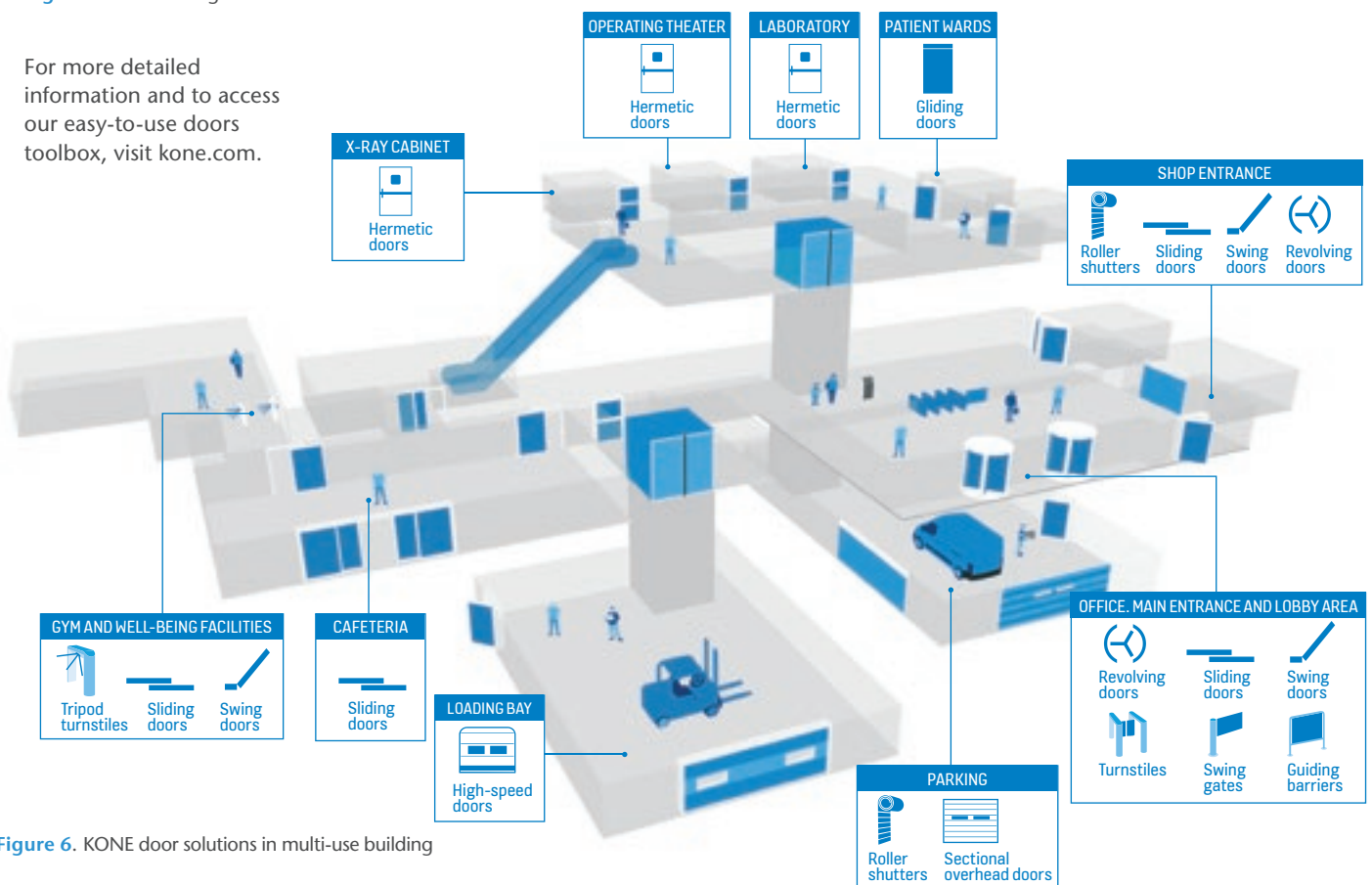
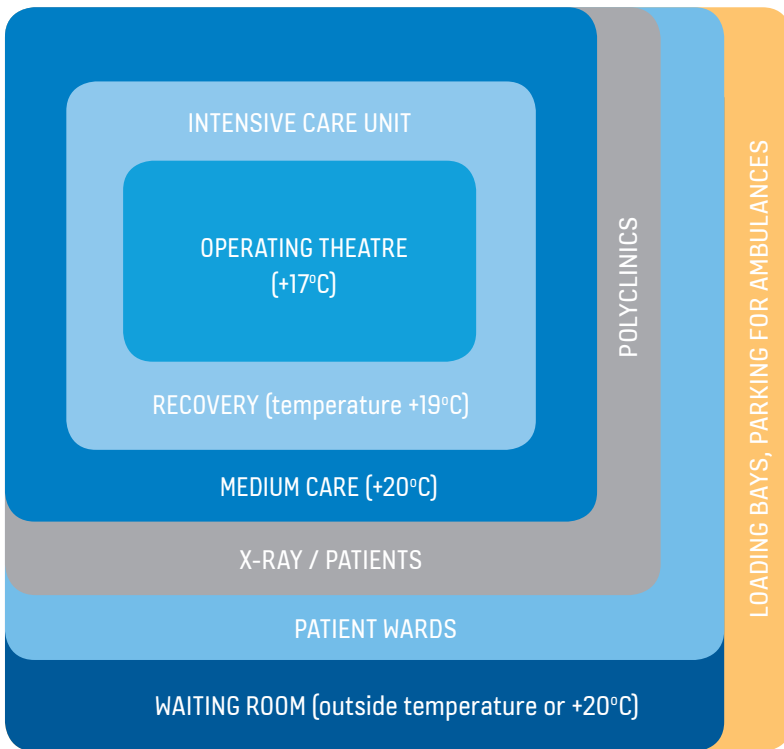


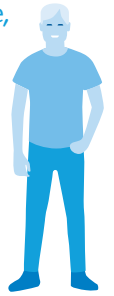
Figure 6. KONE door solutions in multi-use building

MEDICAL BUILDINGS

Medical buildings have a diverse range of requirements when it comes to door solutions, with hygiene and operational efficiency being critically important. From the main entrance and other public spaces like cafeterias, to specialist areas like loading bays, patient wards, and operating theatres, medical buildings typically feature a wide range of different door solutions.



From the end-users' perspective, medical buildings have defined flows of people that need to be separated by building design; doors play an important role in this separation:



- Polyclinic patients
- Hospital patients staying for more than 24 hours
- Staff
- Patients' visitors
- Housekeeping personnel (e.g. canteen staff, cleaners)

The primary goal is to maintain high hygiene level by preventing contamination and the transfer of bacteria and viruses (for example, through compartmentalization and securing the building areas).

Figure 7. Doors help to maintain different pressure and temperature levels in hospitals.



ENTRANCES

MAIN ENTRANCE

Smooth people flow and accessibility for all are the key requirements here. The entrance doors must allow people to move into and out of the building smoothly and safely while simultaneously ensuring a comfortable environment by preventing heating and cooling losses.

→ TYPICAL SOLUTIONS: Sliding and revolving doors



AMBULANCE AND EMERGENCY ENTRANCE

At this entrance, fast-opening doors fitted with code-compliant safety solutions can save precious seconds when transporting patients in need of urgent medical attention and dispatching ambulances.

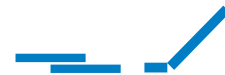
→ TYPICAL SOLUTIONS: Sliding, high-speed, sectional overhead and high-speed sectional doors



STAFF ENTRANCES

It is important to create a good balance between smooth access and high security at staff entrances. This can be achieved by integrating doors with building access control systems.

→ TYPICAL SOLUTIONS: Sliding and swing doors, access control integration



COMMON INTERNAL FACILITIES

CAFETERIA

Here, doors must provide access for large volumes of people simultaneously, while at the same time being unobtrusive and space-efficient.

→ TYPICAL SOLUTIONS: Sliding doors



HALLWAYS AND CORRIDORS

Well-designed doors in hallways and corridors improve patient comfort by reducing noise, help reduce energy costs by retaining heat, and provide fire protection through compartmentalization.

→ TYPICAL SOLUTIONS: Sliding, gliding and swing doors



LOADING BAY

Medical buildings take delivery of large quantities of medicines, food, and other goods every day. The door solutions for these areas need to be durable, reliable, and energy efficient.

→ TYPICAL SOLUTIONS: Sectional overhead doors, high-speed doors, roller shutters



SPECIAL ROOMS

OPERATING THEATERS AND X-RAY ROOMS

For doors, these are the most demanding environments in hospitals. They must provide fire protection, sound reduction, and radiation protection where required, and cannot interfere with magnetic fields as this could disrupt sensitive equipment.

→ TYPICAL SOLUTIONS: Hermetic doors, access control integration



PATIENT WARDS

It is recommended to have a wide opening in patient wards to allow easy access for patients in wheelchairs and hospital beds. Quiet, space efficient and hygienic doors improve accessibility for patients in wheel chairs.

→ TYPICAL SOLUTIONS: Gliding doors



OFFICE BUILDINGS

Office buildings are generally open environments, so it is vital that the flow of people into, through, and out of them is efficiently controlled. Doors play a key role in all areas of these busy environments, from the main entrance and lobby to individual floors and restaurant areas. They are also important in terms of compartmentalizing the building for the purposes of fire protection and access control.



A typical office building features a wide range of different door types, including revolving, sliding, swing, and gliding doors. Lobbies may also include turnstile solutions to improve people flow, enable secure access control, and provide clear guidance for building users.



With the right types of doors in the right locations, the building will be a pleasure to use for tenants and visitors, and also more attractive to potential tenants. There is a wide range of issues to take into consideration when specifying door solutions for office buildings, including:



- Capacity and accessibility requirements
- Traffic peaks (morning, lunchtime, evening)
- Available space for door solutions
- Safety
- Fire safety and related regulations, and evacuation routes
- Security, including access control needs
- Environmental issues such as heating, cooling, insulation, and drafts
- Soundproofing
- Restroom access

ENTRANCES

MAIN ENTRANCE AND LOBBY AREA

The main entrance and lobby are among the most important elements of any office building. The prestige of the building and its attractiveness to potential tenants are highly dependent on high-quality design, smooth people flow, and accessibility for all. Preventing heating and cooling losses helps provide a comfortable environment for tenants.

→ TYPICAL SOLUTIONS: Sliding and revolving doors, People Flow Intelligence solutions, turnstiles



PARKING GARAGES

Security is paramount in parking garages, where a variety of different entrance door types can be used to prevent unauthorized access, ensure that parked vehicles remain safe while unattended, and that only authorized persons can drive them out of the garage.

→ TYPICAL SOLUTIONS: Sectional overhead doors with access control, roller shutters or grilles



COMMON INTERNAL FACILITIES

OFFICES AND MEETING ROOMS

Doors should take up the minimum amount of space possible while at the same time allowing comfortable access and preventing drafts. They should ensure security and privacy by preventing unauthorized access and providing noise isolation in spaces that host confidential discussions, such as boardrooms.

→ TYPICAL SOLUTIONS: Sliding, gliding, swing and hermetic doors



CORRIDORS

In terms of people flow, corridors are the lifeblood of an office building. They allow people to travel between different areas and also provide evacuation routes in case of fire or other emergency. They are also important in terms of compartmentalizing the building for the purposes of fire protection and access control. Doors used in these areas should ensure comfortable people flow while at the same time helping to maintain safety and security

→ TYPICAL SOLUTIONS: Sliding, gliding, swing and fire-rated doors



KONE PEOPLE FLOW INTELLIGENCE

KONE People Flow Intelligence is a comprehensive and flexible suite of solutions for access control, destination guidance, information communication, and equipment monitoring. Based on our industry-leading technology and world-class visual design, these solutions ensure smoother, smarter people flow, enable efficient building management, and add real value to a property. They are scalable, third-party compatible, and can be customized for new or existing buildings. We can also assess the current state of the building and, based on the results, propose the optimal solution to make the building smarter. Together with turnstiles, People Flow Intelligence add value to the lobby by integrating access and destination control into a single, easy-to-use solution.



RETAIL BUILDINGS

Every store type and building is unique in terms of how shoppers move around, how many visit and when, and how they browse. Department stores, big-box stores, shopping centers, and independent retail buildings all have different requirements. Regardless of the business model, doors play a very important role in ensuring the smooth, safe, and secure flow of people and goods.



Pedestrian doors help create the optimal shopping experience and ensure the quickest possible return on investment, while industrial doors ensure a smooth flow of goods into, around, and out of the building. In the event of an emergency such as a fire, the doors should allow large numbers of people to safely escape the building in the shortest possible time, while also helping prevent the spread of fire and smoke.

The issues to take into consideration when specifying door solutions for retail buildings include:

- Capacity and accessibility requirements
- Desired people flow routing, depending on the store type
- Relationship between doors and vertical transportation solutions (see Planning retail People Flow handbook and KONE Escalators and Autowalks planning guide)
- Available space for the door solutions
- Fire safety and related regulations, evacuation routes
- Security, including burglary protection needs
- Accessibility requirements
- Environmental factors such as heating, cooling, and insulation
- Goods flow for loading-bay and warehouse areas

In retail, the end-user experience is everything. Keeping visitors and tenants happy is about delivering the best possible shopping experience, and this means keeping people and goods flowing smoothly.



Automatic doors provide security for stores and help cut energy costs. Retail centers typically feature a combination of sliding and revolving pedestrian doors, as well as industrial door solutions.

➔ TYPICAL SOLUTIONS: Sliding, swing and revolving doors, roller shutters or grilles, high-speed doors, sectional overhead doors



INFRASTRUCTURE BUILDINGS

Infrastructure buildings include public transportation hubs like railroad, bus, and metro stations, as well as airports. These busy environments place heavy demands on equipment. Door solutions have to be durable and reliable, since unexpected breakdowns can have huge repercussions for travelers. If the doors are not well planned, they can create bottlenecks that present a significant security and safety risk.



Typically, sliding or revolving doors are used at main entrances to provide access to the building. These doors handle huge traffic volumes, especially during peak travel times. Doors are also used to provide gate or platform access, to link different areas of the building, and to compartmentalize areas such as lounges, meeting rooms, or security-controlled spaces. Turnstiles and tripod turnstiles – as standalone units or integrated with access control systems – can be used to provide authorized access to gates, platforms, and restrooms.

Infrastructure buildings are often integrated with other facilities to form multi-use buildings, which bring their own set of people-flow challenges. The issues to take into consideration when specifying door solutions for infrastructure buildings include:

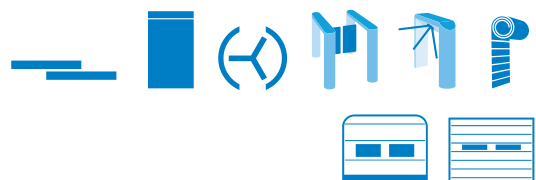
- Ensuring smooth, convenient people flow for passengers with luggage
- Providing comfortable and convenient access to meeting, lounge, and spa facilities
- Preventing unauthorized access to security-controlled areas – a particularly important consideration in airports
- Planning for complex people flow routes and heavy traffic peaks
- Use of doors to provide guidance for passengers – the door design should invite you to pass through
- Requirements for staff access
- Industrial door requirements for specialist areas such as luggage storage facilities and parking garages
- Fire safety and related regulations, and evacuation routes
- Security requirements
- Environmental factors such as heating, cooling, and insulation

With huge volumes of people passing through every day, often around the clock, rock-solid people flow planning is critical. Safety is also of paramount importance, since in the event of an emergency such as a fire, the doors should allow large numbers of people to safely escape the building in the shortest possible time.



High-traffic, complex environments like bus, railroad, and metro stations can incorporate a huge range of door types, all designed to serve a specific purpose. In addition to pedestrian doors, airports also feature a wide range of specialized industrial doors for emergency and maintenance vehicle depots, aircraft hangers, and baggage handling operations.

➔ TYPICAL SOLUTIONS: Sliding, gliding, and revolving doors, turnstiles, roller shutters, grilles, high-speed doors and sectional overhead doors.



HOTELS

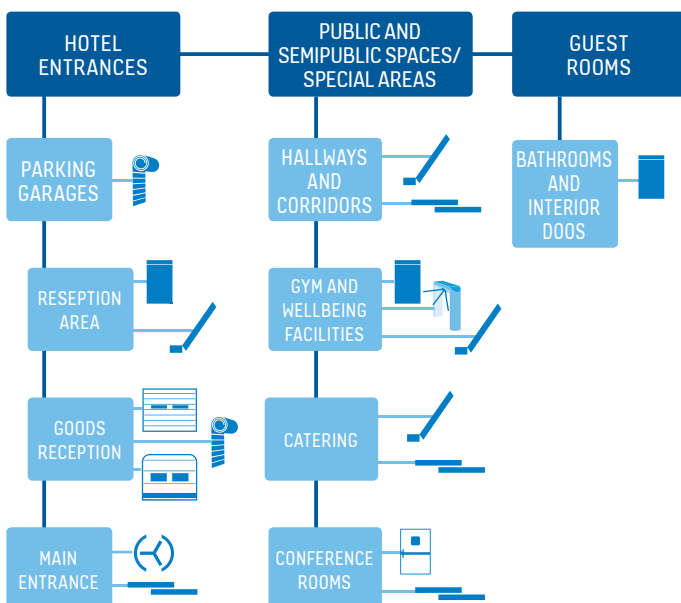
In these environments it's impossible to overstate the importance of the entrance and lobby area. Guests will base their first impressions of the hotel on their experience as they enter, and well-planned door solutions play a critical role in ensuring that this experience is welcoming and hassle-free – every time. Around the hotel, doors also provide comfortable access to areas like gyms and spa facilities, public bathrooms, and meeting spaces. Just like any other building, hotels also experience traffic peaks; during busy hours people are checking in or out in large numbers, so entrance door solutions need to be carefully planned to ensure smooth people flow.

The issues to take into consideration when specifying door solutions for hotel buildings include:

- Ensuring spaciousness in entrance and lobby areas
- Optimizing people flow with a variety of entrance solutions (e.g. revolving and sliding doors)
- Ensuring smooth, convenient people flow for guests with luggage and other accessibility requirements
- Heavy traffic peaks at busy times (check-out and check-in) and during the breakfast rush
- Fire-rating requirements for all doors in line with local regulations
- Safety, both from the point of view of emergency exits and evacuation routes, but also general end-user safety
- Parking garage requirements and ensuring smooth flow into and out of goods reception areas
- In-room solutions for areas like bathrooms; soundproofing solutions for meeting spaces
- Separate, secure routes for staff and maintaining smooth goods and people flow for housekeeping and maintenance activities



➔ TYPICAL SOLUTIONS:



Guests appreciate a feeling of space, a welcoming entrance and lobby area that ties in seamlessly with the rest of the building's design, and the ability to move around comfortably and with as little hassle as possible. As well as guests, hotels need to take care of the needs of their staff, too. This means providing secure access and easy movement between the different areas of the building to ensure that the working day runs as smoothly as possible, with staff able to provide the best possible service.



RESIDENTIAL BUILDINGS

When it comes to people's homes, the focus is on safety, security, and convenience. Fire protection and other relevant regulations are also extremely important considerations. Here, door solutions work in harmony with other building equipment to ensure the best possible quality of life for all residents.



Residential buildings are increasingly evolving into mixed-use facilities that also incorporate retail and office spaces. This trend demands a clear separation of the different functions' people flows while still maintaining accessibility. Some residential buildings may also incorporate features that are more typical of offices or hotels. For example, upscale residential buildings may have a lobby and reception, and some may even have personal elevators going directly to apartments. All these cases place unique demands on the building design in terms of the appropriate door solutions.

The issues to take into consideration when specifying door solutions for residential buildings include:

- Ensuring smooth, convenient people flow for all residents with any accessibility requirements and maximizing usable floor space within apartments
- Emergency exits and evacuation routes
- Parking garage requirements
- Access to shared facilities like laundry rooms, garbage disposal facilities, and other communal spaces
- Goods and people flow for maintenance activities

Every resident should be able to move into, out of, and around the building safely and smoothly, regardless of mobility issues or other challenges. Residential buildings are home to a variety of different user groups, each with different needs to address. These include:

- End-users: families with young children, elderly people, young professionals, people with mobility challenges and visually impaired people, visitors
- Service providers: security personnel, facility management personnel, cleaners and maintenance staff



➔ **TYPICAL SOLUTIONS:** Sliding and swing doors at pedestrian entrances, grilles in parking garages and, for example, to control access to communal garbage disposal facilities.



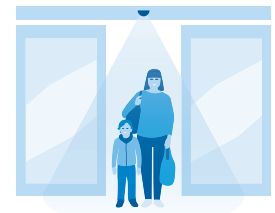
THE KONE BUILDING DOOR OFFERING

This section of the handbook gives you a brief overview of our door offering and the key benefits of choosing KONE solutions. It presents a short overview of each door type along with the different types of buildings they are typically used in.

WHY CHOOSE KONE DOOR SOLUTIONS?

1 CUTTING-EDGE SAFETY FOR PEACE OF MIND

- All our door solutions feature the intelligent technologies and fulfill all relevant safety standards to ensure the safe, secure flow of people and goods.
- Our accessibility expertise ensures that everybody can enter and exit your building safely and smoothly for its entire lifetime.



2 EXCELLENT ECO-EFFICIENCY

- Our automatic doors can reduce the loss of warm or cool air from your building, thereby helping to cut heating or cooling costs.
- For personnel who work close to doorways, automatic doors can significantly increase comfort by minimizing sudden changes in internal temperature or noise.



3 INNOVATIVE AND FLEXIBLE DESIGN












- We offer a wide range of flexible design options that help you blend doors with your building's style.
- Our products feature excellent attention to detail and high-quality finishes.



4 SEAMLESS INTEGRATION FOR SMOOTH, SAFE PEOPLE FLOW

- Our door solutions are designed to work in harmony with other equipment in the building to help people move around safely, comfortably, and without waiting.
- To help create a harmonious look and feel throughout the building, the visual design of our door solutions is consistent with the rest of our offering.



PEDESTRIAN DOORS	TURNSTILES	INDUSTRIAL DOORS
Revolving doors 	Half-height turnstiles 	Sectional and high-speed sectional doors 
Sliding doors 	Tripod turnstiles 	High-speed doors 
Swing door operators 	Swing gates 	Roller shutters and grilles 
Gliding doors 	Guiding barriers 	
Hermetic doors 		



KONE REVOLVING DOORS

Our revolving doors combine high-quality materials, flexible operation, and excellent durability with outstanding energy efficiency. The KONE Revolving Door 100 is the perfect complement to buildings where visual appearance is as important as performance. The KONE Revolving Door 50 is ideal for busy environments where efficient, smooth people flow is critical. The KONE Revolving Door 30 is an economical way to provide a modern and efficient entrance solution.










SPECIFICATIONS

- External diameter:
 - KONE Revolving Door 30: 2100–3700 mm
 - KONE Revolving Door 50: 4120 or 4720 mm
 - KONE Revolving Door 100: 2100–3300 mm
- Standard passage height: 2100 or 2200 mm
 - Optional passage height: up to 2700 mm

FEATURES AND OPTIONS

- Customizable to match your building design
- Attractive, energy-efficient LED lighting
- Latest safety technology
- Durable and easy-to-clean materials
- Optional burglar-resistant features
- Optional three or four collapsible or foldable wings
- Connection profile to the facade is having a thermal break
- Code and standards compliance (see Appendix 1 for more information)



 <p>MEDICAL</p> <ul style="list-style-type: none"> ▪ Main entrance and lobby area 	 <p>OFFICE</p> <ul style="list-style-type: none"> ▪ Main entrance and lobby area 	 <p>INFRASTRUCTURE</p> <ul style="list-style-type: none"> ▪ Main entrance 	 <p>RESIDENTIAL</p>	 <p>RETAIL</p> <ul style="list-style-type: none"> ▪ Main entrance and lobby area 	 <p>EDUCATIONAL/ LEASURE</p> <ul style="list-style-type: none"> ▪ Main entrance and lobby area 	 <p>HOTEL</p> <ul style="list-style-type: none"> ▪ Main entrance and lobby area
--	---	--	---	--	---	--



KONE SLIDING DOORS

Our automatic sliding doors are suitable for a wide variety of building types, from offices and residential buildings to retail environments and transit hubs. They are compact, durable, and energy efficient, and can be enhanced with a variety of security and safety options.



SPECIFICATIONS

- Max. height: 2600 mm
- Max. width:
 - 3400 mm door leaves
 - 7000 mm door leaves and two fixed side panels
- Operation: automatic
- Operator: KONE UniDrive® or KONE UniDrive® Compact

FEATURES AND OPTIONS

- Multiple profile systems: standard (35 mm) or slim (20 mm) aluminum, robust (50 mm), insulated aluminum (65 mm), full-glass
- Single and double sliding, telescopic, prismatic, and curved
- Available with three or six leaves (applicable for single or double telescopic doors)
- Customizable design
- Wide variety of safety options, including manual switches, motion sensors, safety screen, and access control integration
- Fire safe, burglar resistant, energy saving, break out, and escape route options
- Code and standards compliance (see Appendix 1 for more information)

MEDICAL	OFFICE	INFRASTRUCTURE	RESIDENTIAL	RETAIL	EDUCATIONAL/ LEASURE	HOTEL
<ul style="list-style-type: none"> ▪ Main entrance ▪ Cafeteria ▪ Hallways and corridors ▪ Ambulance and emergency entrance ▪ Staff entrances 	<ul style="list-style-type: none"> ▪ Main entrance and lobby area ▪ Cafeteria 	<ul style="list-style-type: none"> ▪ Main entrance ▪ Passenger areas ▪ Lounge areas 	<ul style="list-style-type: none"> ▪ Main entrance and lobby area 	<ul style="list-style-type: none"> ▪ Main entrance ▪ Shop entrances 	<ul style="list-style-type: none"> ▪ Main entrance ▪ Cafeteria 	<ul style="list-style-type: none"> ▪ Main entrance ▪ Shop entrances ▪ Meeting and conference rooms

KONE SWING DOOR OPERATORS



We offer four different fully automatic swing door solutions suitable for a wide variety of building types:

KONE UniSwing™ Compact: a space-saving operator compatible with all standard swing doors; ideal for a wide range of applications.

KONE UniSwing™ Solid: a flexible operator for environments where smooth door closing is essential; it includes spring return for closure during power failures.

KONE UniSwing™ FireSafe: a durable operator for powering heavy fire-rated doors; it fulfills EN 1154 and EN 1155 requirements.

KONE UniSwing™ Robust: a flexible solution for a wide range of demanding swing-door applications in most external and internal spaces; includes a spring mechanism that automatically closes the door in the event of a power failure.

SPECIFICATIONS

- Max. door height: 2500 mm
- Max. door width: 1250 mm
- Operation: automatic

FEATURES AND OPTIONS

- Variety of impulse devices, including switches, push-buttons, finger protection, and sensors
- Can be integrated with access control and central locking systems
- Code and standards compliance (see Appendix 1 for more information)



MEDICAL	OFFICE	INFRASTRUCTURE	RESIDENTIAL	RETAIL*	EDUCATIONAL/ LEASURE	HOTEL
<ul style="list-style-type: none"> ▪ Hallways and corridors ▪ Staff entrances 	<ul style="list-style-type: none"> ▪ Office entrances and corridors 	<ul style="list-style-type: none"> ▪ Main entrance* ▪ Passenger areas <p>* As an additional door for emergency exit</p>	<ul style="list-style-type: none"> ▪ Main entrance 	<ul style="list-style-type: none"> ▪ Main entrance ▪ Shop entrance <p>* Double swing doors are commonly used</p>	<ul style="list-style-type: none"> ▪ Main entrance ▪ Room entrances and corridors* <p>* Particularly fire doors</p>	<ul style="list-style-type: none"> ▪ Main entrance* ▪ Gym and wellbeing facilities <p>* As an additional door for emergency exit</p>

KONE GLIDING DOORS



Our gliding door solutions are designed for environments where space efficiency, wheelchair access, and noise reduction are important factors. The door panels are held in place by magnetic fields rather than traditional rollers or tracks, so they generate virtually no noise and are easy to open and close.



SPECIFICATIONS

- Max. height: 2300 mm
- Max. width: single 1800 mm, double 2250 mm

FEATURES AND OPTIONS

- Single or double
- Manual or automatic operation with low energy movement
- On-wall or in-wall installation
- Fire protection
- Customizable with a wide variety of design options and accessories
- Soft-close option enables the door slow down inclosing movement
- Can be integrated with patient lift systems in hospitals
- Code and standards compliance (see Appendix 1 for more information)



MEDICAL	OFFICE	INFRASTRUCTURE	RESIDENTIAL	RETAIL	EDUCATIONAL/ LEASURE	HOTEL
<ul style="list-style-type: none"> ▪ Patient wards 	<ul style="list-style-type: none"> ▪ Office room entrances and narrow corridors 	<ul style="list-style-type: none"> ▪ Passenger areas in lounges 	<ul style="list-style-type: none"> ▪ Apartment rooms 		<ul style="list-style-type: none"> ▪ Gym and wellbeing facilities 	<ul style="list-style-type: none"> ▪ Meeting and conference rooms ▪ Gym and wellbeing facilities ▪ Hotel rooms (bathrooms and interior doors)

KONE HERMETIC DOORS



Our hermetically sealed doors offer all the benefits of KONE’s standard door products and can be customized to meet the needs of operating theaters, laboratory cleanrooms, areas that require X-ray and other radiation protection, and spaces that require soundproofing.



FEATURES AND OPTIONS

- Powered by the efficient, reliable KONE UniDrive™ operator
- Full glass, stainless steel, laminate, vision or flush panels and lead inlay
- Manual or automatic operation
- Fireproofing option
- Lead-shielding option for environments requiring X-ray and radiation protection
- Optional integrated windows
- Noise isolation up to 37 dB
- On-wall or in-wall installation
- Code and standards compliance (see Appendix 1 for more information)



MEDICAL	OFFICE	INFRASTRUCTURE	RESIDENTIAL	RETAIL	EDUCATIONAL/ LEASURE	HOTEL
<ul style="list-style-type: none"> ▪ Operating theaters and X-ray rooms ▪ Laboratories ▪ Recovery rooms 	<ul style="list-style-type: none"> ▪ Boardrooms and other closed meeting spaces ▪ Recording studios 	<ul style="list-style-type: none"> ▪ Inspection rooms (e.g. in airports) 			<ul style="list-style-type: none"> ▪ Research centers (medical, electronics, pharmaceuticals) 	<ul style="list-style-type: none"> ▪ Boardrooms and other closed meeting spaces

KONE TURNSTILES



The KONE Turnstile 100 and KONE Turnstile 50 are stylish half-height sensor barrier solutions designed for both commercial and public buildings such as offices, airports, railroad stations, and metro stations. The KONE Turnstile 100 features durable, high-quality materials, full access and destination control integration, and stylish lighting and visual guidance options. The KONE Turnstile 30 is an efficient, durable tripod solution for buildings with high-volume throughput, such as sports centers, educational facilities, and transit hubs.



To complement our turnstiles, we also offer:

- Glass and stainless steel swing gates for goods transportation applications and to provide access for users with restricted mobility who may not be able to use turnstiles
- Easy-to-install floor-mounted guiding barriers for controlling access

SPECIFICATIONS

KONE Turnstile 100

- Height: 945 mm
- Length: 2100 mm
- Passage width: 650 mm
- Total width: 1060 mm

KONE Turnstile 50

- Height: 1020 mm
- Length: 2050 mm
- Passage width: 650 mm
- Total width: 1060 mm

KONE Turnstile 30

- Height: 1020 mm
- Length: 1170 mm
- Passage width: 510 mm
- Total width: 770 mm

FEATURES AND OPTIONS

KONE Turnstile 100:

- Visual design matches our elevator signalization and access control reader solutions for a harmonized look and feel throughout your building
- Illuminating arrows and traffic-light visual guidance
- Energy-efficient LED strips provide lighting and enhance appearance
- Available as a standalone system or add-on to other access systems
- Adjustable gate direction, possibility to integrate any brand of access card reader, choice of finishes
- Glass and steel materials are durable, vandal-proof, and easy to clean
- Quiet drive with smooth operation makes turnstiles ideal for internal entrances where noise needs to be kept to a minimum
- For KONE Turnstile 50 and KONE Turnstile 100 the option for users with restricted mobility passage width: 900 mm
- Code and standards compliance (for more information see Appendix 1)

MEDICAL	OFFICE	INFRASTRUCTURE	RESIDENTIAL	RETAIL	EDUCATIONAL/LEASURE	HOTEL
<ul style="list-style-type: none"> ▪ Lobby area 	<ul style="list-style-type: none"> ▪ Lobby area 	<ul style="list-style-type: none"> ▪ Lobby area ▪ Platform entrances 			<ul style="list-style-type: none"> ▪ Lobby area ▪ Gym and wellbeing facilities 	<ul style="list-style-type: none"> ▪ Gym and wellbeing facilities

KONE SECTIONAL OVERHEAD DOORS



Our durable and space-efficient sectional overhead doors ensure efficient goods flow into and out of commercial buildings, and can be customized with a variety of finishes, colors, and glazing options. Existing doors can be easily modernized with our universal KONE UniPower™ solution, and we also offer cost-effective full replacement solutions.



SPECIFICATIONS

- Height: min. 2250 mm, max. 6000 mm
- Width: min. 2000 mm, max. 8000 mm

FEATURES AND OPTIONS

- KONE Sectional or KONE Full Vision door
- Wide range of finishes, colors, and glazing options
- Micro-profiled panel structure fits to modern buildings visual appearance
- Optional choice of panel height and thickness impacts the insulation properties and can improve energy efficiency
- Automatic or manual operation
- Energy-saving option
- Pass-door option for easy personnel access
- Complies with EN 13241-1, EN 12453-1, and EN 12604
- We also offer the KONE sectional high-speed door, which opens up to six times faster than sectional overhead door, making it ideal for industrial environments where time-saving is critical
- It combines the best of sectional and high-speed doors.

MEDICAL	OFFICE	INFRASTRUCTURE	RESIDENTIAL	RETAIL	EDUCATIONAL/ LEASURE	HOTEL
<ul style="list-style-type: none"> ▪ Loading bays ▪ Ambulance and emergency entrances 	<ul style="list-style-type: none"> ▪ Private garages in parking areas ▪ Loading bays 	<ul style="list-style-type: none"> ▪ Bus, train, airport depots 	<ul style="list-style-type: none"> ▪ Private garages in parking areas 	<ul style="list-style-type: none"> ▪ Distribution centers ▪ Loading bays 	<ul style="list-style-type: none"> ▪ Loading bays 	<ul style="list-style-type: none"> ▪ Loading bays

KONE HIGH-SPEED DOORS



Our eco-efficient high-speed doors for external and internal applications are designed to improve goods flow and minimize energy costs in environments such as logistics centers, food processing and distribution facilities, warehouses and loading bays, and vehicle storage areas.



Our highly flexible solutions also help improve safety and convenience. They can be customized with a wide range of colors and materials to match your building, and enhanced with your choice of optional features and accessories. Door panel can have your company logo or any other tailor-made picture.

SPECIFICATIONS

- Max. height: 8000 mm
- Max. width: 10 000 mm
- Operation: automatic, semi-automatic, fully manual



MEDICAL	OFFICE	INFRASTRUCTURE	RESIDENTIAL	RETAIL	EDUCATIONAL/ LEASURE	HOTEL
<ul style="list-style-type: none"> ▪ Loading bays ▪ Ambulance and emergency entrances 		<ul style="list-style-type: none"> ▪ Bus, train, and airport depots ▪ Parking garages 		<ul style="list-style-type: none"> ▪ Warehouses ▪ Chiller and freezer rooms 		<ul style="list-style-type: none"> ▪ Catering areas

KONE ROLLER SHUTTERS AND GRILLES



Roller shutters are ideal for high and wide door openings due to their space-saving roller technology and hard-wearing curtain. They meet the product and safety requirements (EN 13241-1) with respect to mechanical characteristics, heat and noise insulation, wind resistance, and watertightness. The flexible shutter is stable and can be installed in a variety of door openings. KONE grilles are the perfect solution when you need good ventilation and theft protection.



Roller shutter



Grilles

SPECIFICATIONS

Roller shutters

- Width: 1000 - 18 000* mm
- Height: 1000 - 12 000 mm

Grilles

- Width: 1000 - 18 000* mm
- Height: 1000 - 8000 mm

FEATURES AND OPTIONS








Roller shutter solutions:

- Roller Shutter Easy has a simple, robust, and compact design, and is quick to install.
- Roller Shutter ThermoTeck has a high-grade galvanized steel finish with a transparent protective topcoat, this makes the shutter robust and provides excellent heat insulation.
- Roller Shutter Fire Proof consists of double-skinned 1 mm galvanized steel sections filled with mineral wool. It has been tested in accordance with STN EN 13501-2:2005 and certified for EW30, EW45, EW60, E30, and E60 fire resistance classes.

Grille solutions:

- Straight honeycomb, plain aluminum profiles with galvanized bottom bracket and consoles, and primer-coated winding shaft.

* Upon request

						
MEDICAL	OFFICE	INFRASTRUCTURE	RESIDENTIAL	RETAIL	EDUCATIONAL/LEASURE	HOTEL
▪ Parking garages	▪ Parking garages	▪ Parking garages	▪ Parking garages	▪ Shop entrances ▪ Parking garages	▪ Parking garages	▪ Parking garages

A DEDICATED PARTNER

SUPPORTING YOU EVERY STEP OF THE WAY

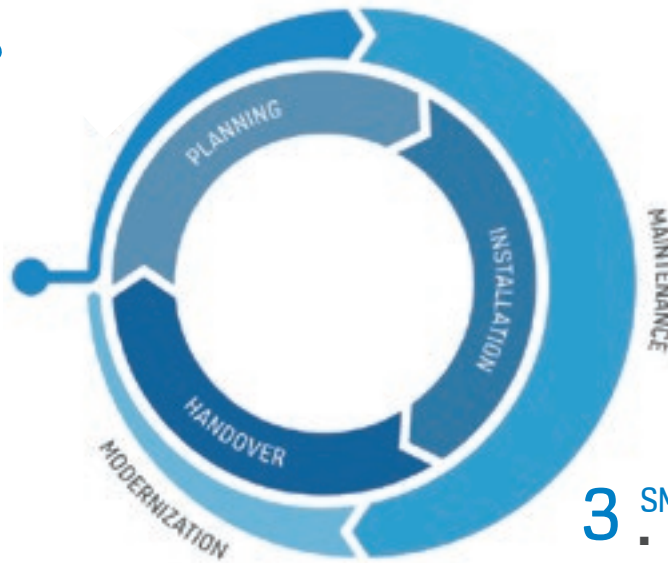
1 EXPERT DESIGN AND PLANNING SERVICES

- Comprehensive planning advice
- Easy-to-use online design tools



2 SAFE AND EFFICIENT INSTALLATION

- Strict quality criteria
- Maximum site safety
- Professional project management



3 SMOOTH HANDOVER

- Full quality assurance with handover
- Excellent spare part availability
- Preventive KONE Care™ maintenance solutions for superb reliability



5 MODERNIZATION

- Assessment and planning
- Installation
- Completion



4 PROFESSIONAL MAINTENANCE

- Equipment-specific maintenance plan based on technical properties and use, for all equipment brands and types
- Trained customer service staff at your service 24/7/365
- Extensive service network and continuous customer communication



Visit kone.com to check out our handy online planning tools, find out more about our installation, maintenance, and modernization solutions, and get in touch with a KONE expert.

AWARD-WINNING DESIGN

- Automatic building door solutions can be customized to meet the needs of any property, with a wide range of available materials, finishes, components, and colors
- Components harmoniously match as they have been designed to work together
- Use of hygienic materials and automation, such as elbow push buttons, to decrease contamination risk in special applications
- Glass and high-end material options, for example, in offices and hotels, enable a consistent, stylish look and feel throughout the building
- Expert design tools and services: BIM models, Doors Toolbox, CAD drawings
- Capability to do special projects demanding matching high-level design requirements and respecting the historical heritage
- Solutions to meet accessibility requirements
- KONE Turnstile 100 has won multiple design awards, including iF and Red Dot awards.



SUSTAINABILITY

We are dedicated to continuously improving the environmental performance of our doors business. Our engineering and manufacturing units are ISO 9001 quality management system and ISO 14001 environmental management system certified. KONE doors are designed and built to take the environment into account, with low noise and low energy consumption. We ensure the reliability of your door equipment and prevent breakdowns through our preventive maintenance services. Breakdowns can have a negative impact on the environment as doors that are not operating correctly may result in heating or cooling losses from the building.

We can provide Environmental Product Declarations (EPDs) for our pedestrian products. We conduct life cycle analysis to provide information for our EPDs in order to increase the transparency of the manufacturing process and support continuous product improvement.

We follow Global Warming Potential (GWP) and other environmental performance indicators in our manufacturing process. Also we analyze structure of materials, including the amount of recycled materials. Below is an example of the material structure for KONE Hermetic Door 30.

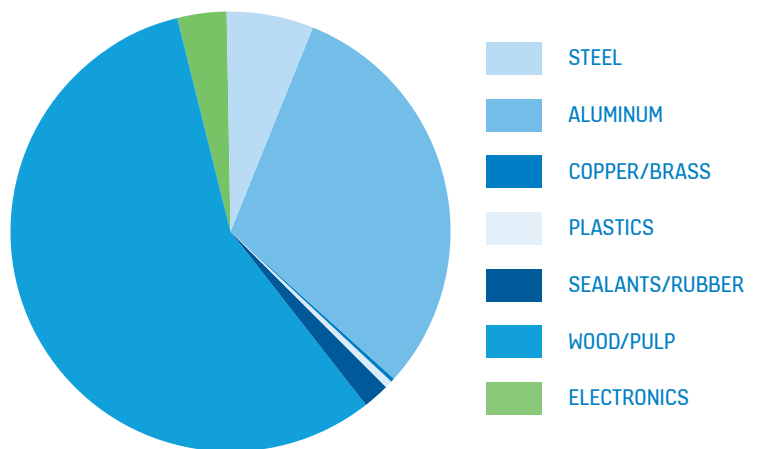


Figure 8. Material structure example for KONE Hermetic Door 30



SAFETY AND MAINTENANCE

To KONE, safety means much more than just conforming with local laws and norms – it’s our number-one priority. KONE door maintenance detects issues before problems arise, reducing hazards and helping to prevent accidents. By making sure that automatic doors are used and maintained properly, you can maximize operational efficiencies in your building while ensuring safe and secure access for all.

PROPER USE OF EQUIPMENT BOOSTS SAFETY

According to the European Working Equipment directive (89/654 and 655/EEC) and the harmonized safety in use standard for pedestrian door sets (EN 16005) as well as respective standard for industrial doors EN 13241 (see the whole list of standards in Appendix 1) the owner of the equipment is responsible for the safety for users. You can facilitate safe and trouble-free access for everyone and ensure a longer life for your equipment by taking care that doors are used and maintained correctly. Proper operation also saves money by eliminating service calls. Building staff should therefore be well informed about the correct use of automatic doors and also be able to instruct users if they spot unsafe behavior.

Service for

500,000 doors.

And for the millions of people who use them.



DID YOU KNOW?



- KONE provides maintenance for doors 365 days of the year. The KONE Care Center is available 24/7 to provide door maintenance and repair services.
- You can easily get a clear and accurate review of the condition of your automatic doors by ordering a KONE Care for Life assessment.

SYSTEMS TO ENSURE SAFETY

We work to ensure that every piece of equipment we maintain complies with the latest standards and meets the highest levels of safety in the industry. The safety of automatic doors depends largely on the standards and norms that were in effect at the time of installation. In recent years a number of harmonized standards have been introduced for pedestrian and industrial automated building doors. These focus on improving safety and performance through better design and on-going professional maintenance. Fortunately, older equipment can be modernized to meet these new standards. With regular maintenance you can increase safety while also maximizing the lifetime of door equipment. The current regulations require professional, regular maintenance for automatic doors.

APPENDIX 1

STANDARDS COMPLIANCE

KONE doors are compliant with the latest European Standards, including:

1. EN 13241-1:2003 + A1:2011: Industrial, commercial and garage doors and gates
– Product standard – Part 1: Products without fire resistance or smoke control characteristics
2. EN 12635:2002 + A1:2008: Industrial, commercial and garage doors and gates
– Installation and use
3. EN 12453 and 12445: 2000: Industrial, commercial and garage doors and gates
– Safety in use for power operated doors
4. EN 12604:2000: Industrial, commercial and garage doors and gates – Mechanical aspects
5. EN 12978:2007 + A1:2009: Industrial, commercial and garage doors and gates
– Safety devices for power operated doors and gates – Requirements and test methods
6. EN 13849-1:2006: Safety of machinery – Safety-related parts of control systems
7. EN 1398:2009: Dock levelers – Safety requirements
8. EN 16034:2014: Pedestrian doorsets, industrial, commercial, garage doors and windows
– Product standard, performance characteristics – Fire resistance and/or smoke control characteristics
9. EN 16005:2012: Power operated pedestrian door sets – Safety in use – Requirements and test methods
10. EN 16361:2013: Power operated pedestrian doors – Product standard, performance characteristics; Pedestrian doorsets, other than swing type, initially designed for installation with power operation without resistance to fire and smoke leakage characteristics
11. EN 60204-1: Safety of machinery – Electrical equipment of machines
– Part 1: General requirements
12. EN 61000-6-2: Electromagnetic compatibility (EMC) - Part 6-2: Generic standards
– Immunity for industrial environments
13. EN 61000-6-3: Electromagnetic compatibility (EMC) – Part 6-3: Generic standards
– Emission standard for residential, commercial and light-industrial environments
14. EN 60335-1: Household and similar electrical appliances – Safety – Part 1: General requirements
15. EN 16304: 2014: Pedestrian doorsets, industrial, commercial, garage doors and openable windows – Product standard, performance characteristics – Fire resisting and/or smoke control characteristics
16. 2006/42/EC: Machine Directive

KONE provides innovative and eco-efficient solutions for elevators, escalators, automatic building doors and the systems that integrate them with today's intelligent buildings.

We support our customers every step of the way; from design, manufacturing and installation to maintenance and modernization. KONE is a global leader in helping our customers manage the smooth flow of people and goods throughout their buildings.

Our commitment to customers is present in all KONE solutions. This makes us a reliable partner throughout the life cycle of the building. We challenge the conventional wisdom of the industry. We are fast, flexible, and we have a well-deserved reputation as a technology leader, with such innovations as KONE MonoSpace®, KONE NanoSpace™ and KONE UltraRope®.

KONE employs close to 50,000 dedicated experts to serve you globally and locally.

KONE Corporation
www.kone.com