

# Sliding Doors

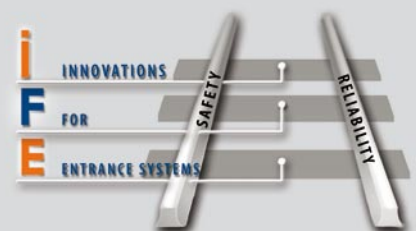


**Entrance Systems for  
Rail Vehicles**

**Mass Transit**

# In mass transit, the entry system dictates the rhythm

Passengers who are sitting in the train or are waiting on the platform do not prevent the driver from keeping his time schedule. However, delays can easily occur during boarding and deboarding. The quality of the entrance system has therefore a decisive influence on the efficiency of rail vehicles. Manufacturers and operators throughout the world know this and choose the high-quality entrance systems from IFE Automatic Door Systems.

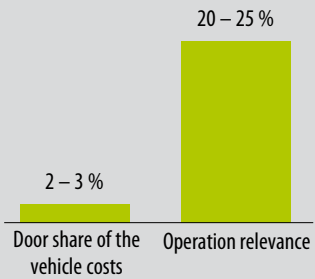




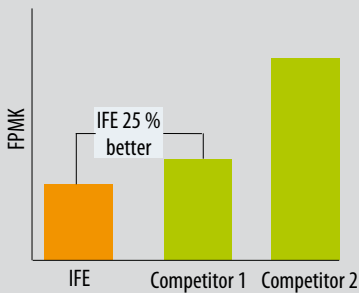
The most important factor for the availability of rail vehicles is the right entrance system. Calculations have shown that the economic benefit of a high-quality entrance system exceeds the purchasing costs by up to ten times.

From product development via manufacture to final inspection and assembly, IFE relies uncompromisingly on quality. In doing so, the company has earned an excellent reputation throughout the world: as the first address for door systems with an excellent cost/benefit ratio over the entire life cycle.

Innovations from IFE anticipate the increasing demands of the market in terms of safety, reliability, and life cycle of door systems. Currently, IFE is setting new standards with modular systems that provide for faster, more flexible and more economic implementation of solutions.



Effects of the entrance systems on operation



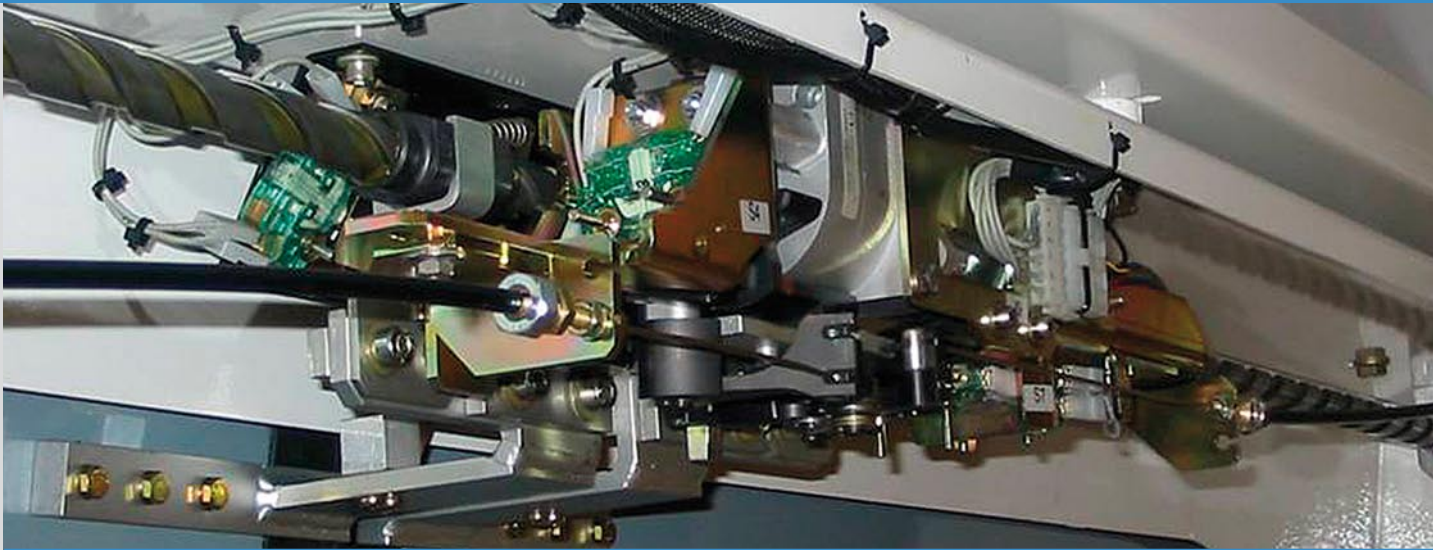
IFE builds the most reliable sliding doors

# Sliding door systems

IFE supplies external sliding doors and pocket sliding doors that are especially suitable for public transport. They are primarily used in underground and commuter trains on routes with medium passenger volume.

Where passenger volume is high, IFE's sliding doors are preferable, as they require less space and provide better sound and heat insulation. Sliding doors are the ideal choice in rail vehicles with no critical environmental requirements.





Electric drive

### Classic Line: simple and reliable IFE sliding doors with electric door drive

An electric drive serves as drive for the sliding door from IFE; this type of drive is used most throughout the world – and for a good reason. It is perfectly suitable wherever frequent closing movements and short opening and closing times are required. It is thus the ideal drive for sliding doors of streetcars, underground trains and urban railways in various designs. With a clear and simple structure, it always comprises robust components, while being insensitive to door warping.

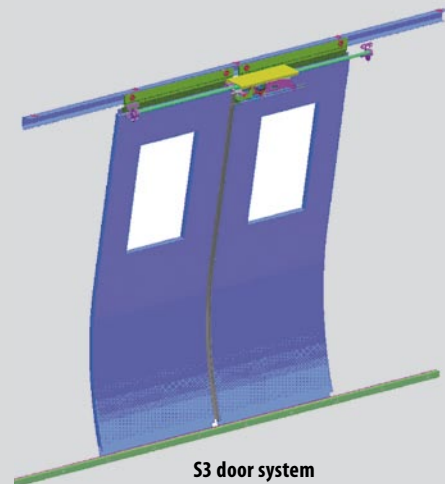
Thanks to its compact modular design, the drive can optimally be integrated into the vehicle.

### Advanced performance

If you have experience, you can break new ground. When developing new concepts, IFE always uses tested and well-tried components. The result are innovative door systems that operate extremely reliably, while simultaneously being more compact, more flexible, and more economic than their predecessors.

### Innovations for specific requirements

IFE drives can be upgraded for special requirements, which are sometimes dictated by the market. On the US American market, for instance, a pushback device is used as additional crush protection system. Here, special cutout devices are used as elements that shut door systems down.



S3 door system

# Everything is under control with the detection systems from IFE

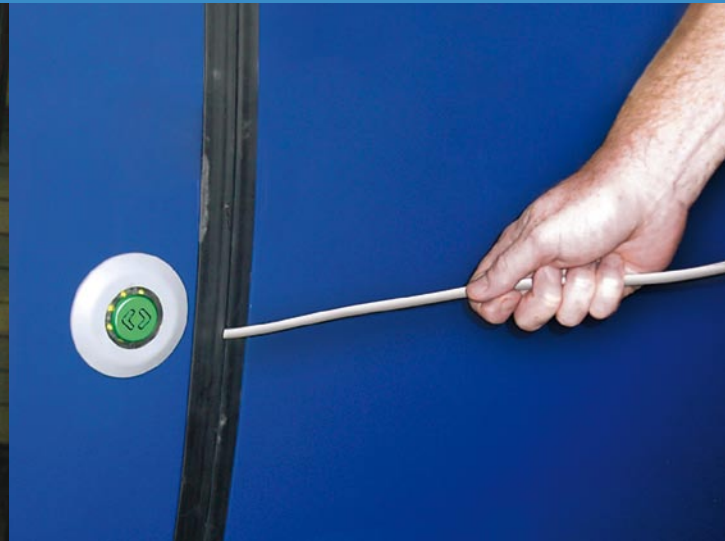
During peak-hour traffic, a lot depends on the right signal being given at the right moment at the closing edge to the entrance door.

Under no circumstances may the passengers be crushed by the closing door. On the other hand, the departure of the train should also not be obstructed every time there is any contact with the door. Here and in other neuralgic points of the entrance area, innovative detection systems from IFE successfully square the circle. Their design guarantees a maximum of safety without impairing punctuality by blind alarms.





Crush protection



Crush detection

### 1 Monitoring and securing of the closing edge

The standard detection systems DS1 to DS4 serve for monitoring and securing the closing edge of automatic doors:

- DS1 – Current monitoring
- DS2 – Distance/time monitoring
- DS3 – Manometric switch
- DS4 – Monitoring with electric strip

The systems meet all applicable standards and requirements. They provide protection against crushing in the closing door, however, do not overreact to every jammed object in a way that the operation of the door would be disturbed by permanent reserving.

Experience has shown that oversensitive detection systems frequently provoke a minority of passers-by intentionally to delay the departure of the train. This is not the case with the detection systems from IFE.

### 2 Checking of the closed door

The extended detection systems DS5 and DS6 check an already closed door:

- DS5 – Crush detection, static
- DS6 – Crush detection, static and dynamic

DS5 checks an already closed door for any jammed objects. The system detects and reports even the smallest deformations in the rubber profile of the closing edge. DS6 additionally detects dynamic forces at the departing train, which might be caused by even the smallest jammed objects, and is capable of initiating the respective response.

# Safe and convenient entrance for everybody

The space between the vehicle and the platform can easily become an obstacle for handicapped and frail people, and for people travelling with small children – in particular when the distance or the difference in level is large. In order to facilitate safe and convenient entrance for all passengers, IFE offers various access devices.







### 1 Gap bridges

The IFE gap bridge reduces the gap between vehicle and platform to a distance that makes boarding possible even for wheelchair users. It is characterised by a plain design and simple construction, and is very reliable in practical use.

### 2 Ramps

IFE ramps make secure access to the vehicle possible for wheelchair users, even if there is a considerable difference between the vehicle and the platform level. Every ramp is supplied as a narrow fully mounted cassette, only requiring a flat installation space of low height.

### 3 Sliding steps

Sliding steps make entrance easier for physically handicapped people and parents with baby carriages, when there is a large gap between the vehicle and the platform. The IFE sliding step is delivered as a narrow fully mounted cassette that requires only a small installation space, and that is easy and quick to assemble. The extension width can be adapted to the requirements.

# Adapted access systems for driver and passenger

IFE also offers suitable door systems for the driver, and for the connection between the carriages. Room-saving, tight and convenient doors for the driver's cab contribute to a pleasant workplace, thus making it easier for the driver to concentrate on his actual task.

To make sure that the passenger and the driver's cab doors match perfectly also optically, while fully satisfying the design specifications of the customer, IFE manufactures door leaves in a large variety of shapes and surfaces, from level surfaces to three-dimensional designs.





Cab door



Slam door



Connecting door

### Cab doors

IFE offers a large variety of door systems to ensure that the driver can access his workplace conveniently and safely.

### Slam doors

For the driver's cab, IFE manufactures light door leaves made of different sandwich structures that fulfil different physical requirements in terms of strength, heat and temperature insulation. The design varies from a level aluminium sandwich structure to a three-dimensional design in fibreglass technology. Many different matching window types, satisfying all needs, are available.

### Connecting doors

Many different IFE systems have proven successful in daily use as connecting doors between the driver's cab and the passenger area. The product range varies from simple manual slam doors to fully automatic sliding doors.

### Door leaves

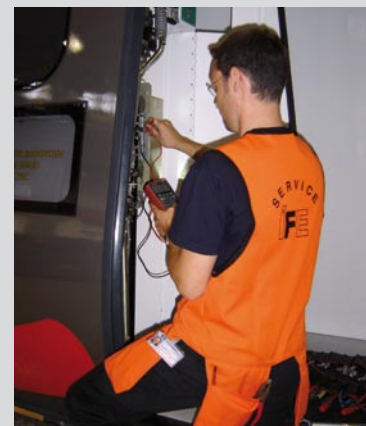
IFE supplies a wide range of the latest sandwich and full-glass doors as door leaves. They comply with the project-specific fire protection requirements as well as the applicable sound insulation and heat transition thresholds. The sandwich door leaf consists of an aluminium frame with aluminium cover plates and different filling, depending on the physical requirements. IFE also produces high-grade steel door leaves for special requirements. The windowpane either is glued in, or is mounted into the door leaf by a mounting rubber.



Door leaves

# Services for demanding customers

After the purchase is before the purchase: IFE is the partner for rail vehicle manufacturers and operators that they can rely on in tough practical operation. Offering a variety of after sales services, IFE ensures that every IFE door system lives up to its name.





### Assembly

- Standard service: Initial installation and commissioning
- Extended service: Supervision of the installation during the assembly phase
- Complete service: Complete installation including logistics and putting into operation

### Maintenance

- Spare part monitoring
- Repair at fixed cost and delivery time
- Concepts for general overhaul (material, logistics, service)
- Repair and maintenance in the depot

### Customer training

- Assembly and initial operation
- Operation and handling of the diagnostic equipment
- Repair and maintenance

### Upgrades

- Adaptation of the control and diagnostic concept
- Modernising/extension of the crush detection or crush monitoring system
- Modernising/replacement of components

# The market chooses IFE

The best proof of the high quality of the entrance systems from IFE is the high approval that these find on the international rail vehicle markets. Here is a list of customers that have successfully used IFE sliding doors in mass transit for many years.



Underground trains



Regional trains

**IFE systems and components for mass transit are, for instance, used in**

- Athens • Delhi • Dublin • Guangzhou • Hamburg
- Hong Kong • Incheon • Jabotabek • Lisbon • London • Los Angeles • Munich • Prague • Puerto Rico • São Paulo • Shanghai • Singapor • Teheran
- Washington

**IFE door systems are on the rail throughout the world**

Not only in mass transit do rail vehicle manufacturers and operators worldwide rely on IFE when an entrance area is to be designed more modern, safer, and more convenient. All companies listed here have placed orders with IFE amounting to at least 1 million Euros each during the last eight years.

**Car builders**

- Alstom • AnsaldoBreda • Bombardier • CAF • CRC
- EDI • Firema • Rotem • Siemens • Sifang • Skoda
- Stadler • Tüvasas • United Goninan • ZOS