Sliding Plug Doors

Entrance Systems for Rail Vehicles

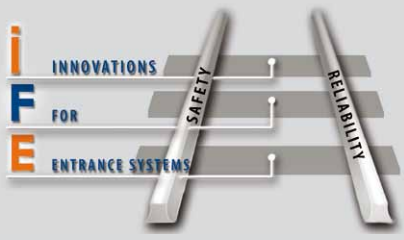
Railway Passenger Cars and High Speed Trains

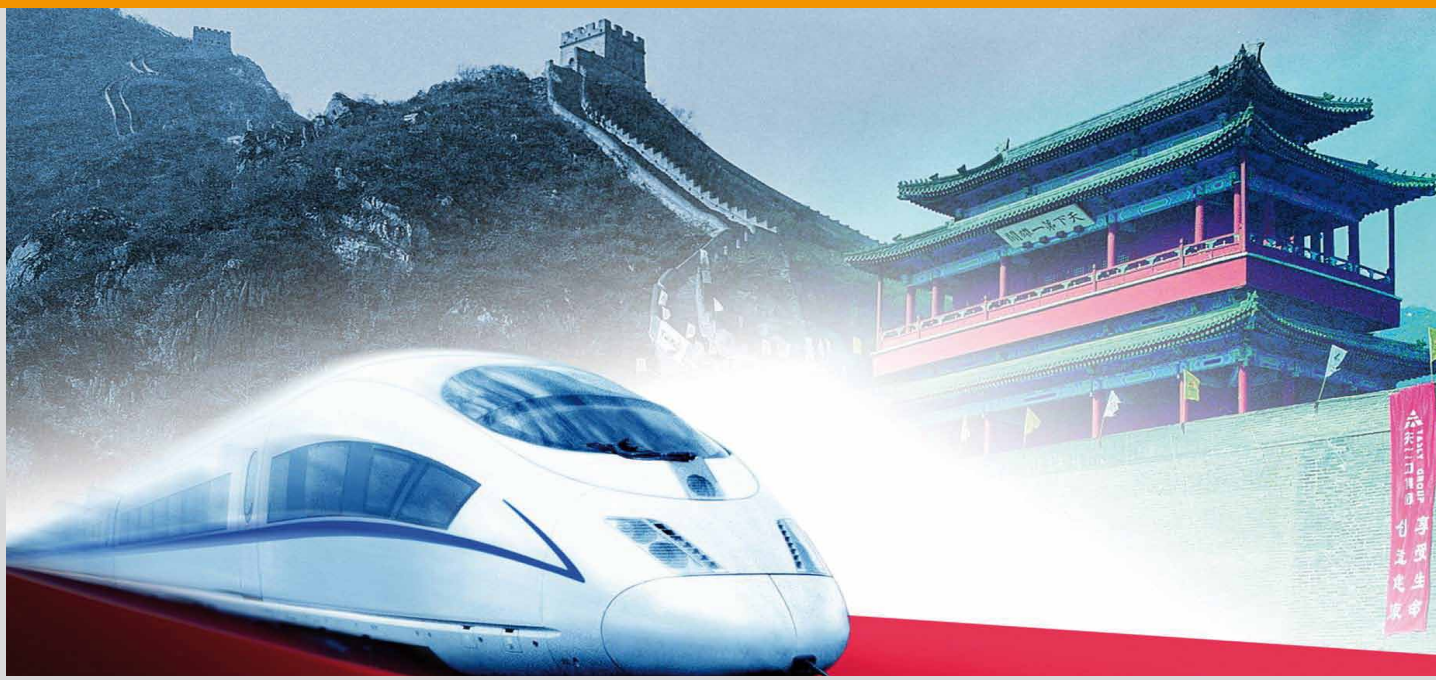
iFE Innovations For Entrance Systems
www.ife-doors.com

Entrance Systems

High speed begins with the entrance system

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.

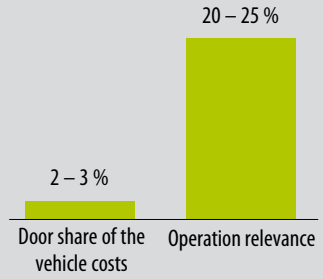




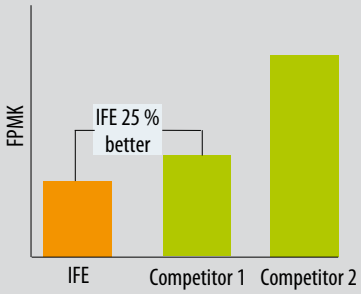
The most important factor for the availability of rail vehicles is the right entrance system. Calculations have shown that the economic benefit of a high-quality entrance system exceeds the purchasing costs by up to ten times.

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 plug doors

Sliding plug door systems

IFE offers a wide variety of robust door systems that have proven successful in practical operation, and that meet all critical requirements. Thanks to short opening and closing times, these systems ensure smooth operation, optimally using the space available, and have excellent tightness and insulation values.

IFE supplies single leaf doors for high-speed trains. The reliable systems are also suitable for winter and are designed as simply as possible. To satisfy the passengers' increased demands in terms of comfort, the sliding plug doors are inserted flush with the outer panel of the carriage.

Modern doors use electrical drive systems, but IFE also offers pneumatic drive systems.

Drive system

Doors for high speed trains

Classic Line: DET & RIC

The DET & RIC door system is characterised by the clear design and the uncomplicated mechanical structure of IFE Classic Line. It is mounted inside the entrance width. The door leaves are locked in passive arresters both at the front and at the rear edge.The lock is thus resistant to door warping. The honeycomb-sandwich structure is enclosed by an aluminium-profile door frame that excellently insulates the DET & RIC. Pressure tightness is ensured even at high speeds by additional pneumatic pressure devices.

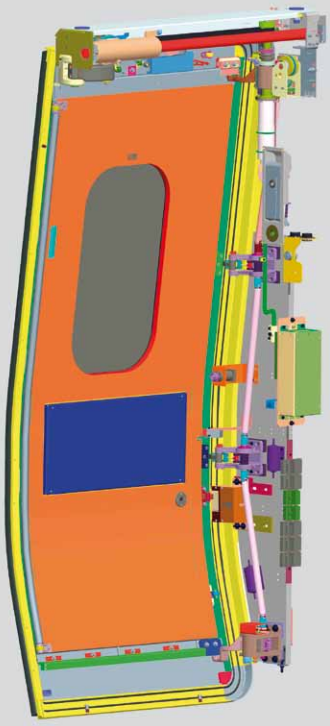
DET & RIC is approved in many countries in the world. The customer purchases an extremely robust system that has been well-tried in practice.

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.

The new door system DET

DET is an exclusively electric door system. It does not require any compressed air at the pressure-proof door, not even for sealing: DET does not require inflatable seals. Thanks to a few significant innovations, it is possible to move the door leaf, to lock it and to keep it pressure-proof, even with the restricted force of a drive motor. Contrary to Classic Line, the door is secured by over-dead centre locks. As DET does not need the more damage-prone pneumatic components, the system is especially reliable.



Door system for high speed train

Detection Systems

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.

Boarding Aid

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

2

1 Sliding steps

Sliding steps from IFE reduce the gap between platform and entrance step to ensure that handicapped people can also board the train conveniently. They are available with a closed flat cassette from which the tread drives out, or with a tread mounted outside the cassette. The maximal extension travel is adjusted according to the specific project. The sliding steps can be equipped with obstacle, weight, and platform detector, upon request. Variable extension travels are also possible. The sliding steps can thus ideally adapt to the requirements of the customers. They accommodate the vehicle builder due to their simple and quick assembly.

2 Moveable steps

IFE moveable steps have a fixed extension travel. The extension movement can be adapted to the specific project. Weight detection is possible upon request. IFE offers moveable steps with different extension movements, which also determine the installation room in the vehicle. Thanks to many years of experience with moveable steps, IFE can respond to special requirements and supply innovative solutions.

Adapted Access Systems

Train doors – the complete program

IFE does not only offer the right door systems for entrance and exit of the passengers: With internal doors, the carriages can be divided into different areas, fire doors meet tomorrow's safety regulations already today, and loading doors facilitate quick handling of bulky luggage.

To make sure that all door systems match perfectly also optically and comply exactly with the design specifications of the customers, IFE manufactures door leaves of the most different shapes and surfaces.

Connecting door, entrance door and loading door

Internal doors

For the internal area, IFE supplies electrically or pneumatically operated doors with full-glass or aluminium frame design. The opening command is given by a pressure button, a movement detector, or a handle. The closing command is given if the door area has been free of passengers for several seconds, or after a defined period.

Fire doors A1–15

As a result of the horrible tunnel accidents that occurred in the last couple of years, the regulations applicable to fire doors have become increasingly stricter. IFE fire doors therefore comply with the standard TS 45545-3. They are available as single and double leaf design. The drive is optionally electric or pneumatic.

Loading doors

Passenger trains that must also transport bicycles and bulky luggage require large-surface doors for the loading space that are quick and easy to open and to close. IFE supplies loading doors with fully automatic or semi-automatic door operation. As the door leaves are heavier than normal due to the large free opening widths, the drive system has also been designed extremely robust. The design of the loading doors can be matched to the other vehicle doors. The technologies also correspond to those of the passenger doors.

IFE supplies loading doors as single-leaf systems with a 42-mm thick sandwich door leaf for door opening clearance widths of between 800 mm and 1400 mm. Both electric and pneumatic systems are used as drives.

1. Internal door (single-leaf)
2. Internal door (doubleleaf)
3. Connecting door (singleleaf)
4. Connecting door (double-leaf)
5. Fire protection test

1.

2.

3.

4.

5.

Services

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.

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.

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

References

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 plug doors for high speed trains for many years.






High speed trains



Railway passenger cars

IFE systems and components for high-speed trains are, for instance, used in

Austria • China • Croatia • Czechia • Finland • Germany • Great Britain • Greece • Hungary • Italy • Norway • Poland • Russia • Slovakia • Slovenia • Spain • Sweden • Switzerland

Operating companies

MOR • VR • Virgin • Tren Italia • CP • RENFE • CD • Cisalpino • ÖBB • SNCB • Guangzhou Railways • DB • OSE • MAV • Indian Railways • Iran Rail • NSB • PKP • RZD • SJ

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