

## Highest performance for railway technology

FRÄNKISCHE Industrial Pipes (FIP) offers comprehensive product solutions for efficient and effective mechanical protection of cables and sensitive data lines. FIPSYSTEMS® cable protection products primarily protect the electrical insulation of cables, wires and sensitive data lines, which are laid in conduits or fabric hoses, from a wide variety of external influences. They can furthermore decisively improve the RAMS/LCC characteristics (Reliability – Availability – Maintainability – Safety/Life Cycle Cost) of electrical applications and equipments.



### Roof transitions

Roof transitions of electrical cables are heavily stressed. Cable transitions between railway carriages require products with excellent flexibility, fatigue strength and weather resistance. They have to withstand a wide range of weather conditions and the mechanical stresses that occur. For the individual, installation-engineering requirements, the FIPSYSTEMS® product range also includes a large variety of suitable accessories for optimal fixation and installation.



### Carriage transitions

Lateral carriage transitions are subject to high dynamic stress in terms of dynamic bending and torsion. Suitable conduit supports and protectors ideally and permanently complement the connections with FIPLOCK® cable protection tubes and FIPLOCK® ONE connection fittings. This also applies to the expectable operating temperatures and climatic conditions.



### Couplers

E-couplers are often exposed and frequently subject to high mechanical and weather loads. FIP offers suitable application engineering solutions to meet the high requirements at all times. In this area of application, high system tightness in addition to excellent mechanical strength is crucial.



## Wheel sensors and sanding systems

Wheel sensors, tachymetry, or heating cables to sanding systems are often very exposed to environmental impacts. The systems and electrical connections are partly also exposed to strong vibrations. The focus here is on an appropriate connection strength of the connection fittings, high system tightness and mechanical resistance. FIPSYSTEMS® cable protection pipes and connections meet the highest demands on the connections.



## Passenger areas

Cables and sensitive data lines for modern railway monitoring, telecommunication and information systems in and on the vehicles can be optimally installed in cable protection conduits with suitable fittings. This allows easy retrofitting or replacement of cables if necessary. Various FIPLOCK® mounting solutions allow a safe installation and optimal fastening of the conduits. Suitable products meet the highest fire protection requirements for high passenger safety.

## Control-/Monitoring systems

Selected FIP cable protection products are particularly suitable for the pre-assembly of cable harnesses, for proper cabling of control- and monitoring systems. The FIPSYSTEMS® program includes corrugated conduits and connections for a controlled protected supply line to the control/monitoring cabinets or textile hoses for a clean and abrasion-protected bundling of the conductors inside the cabinets.



## Track side

The increasing monitoring and control of vehicles and systems on the tracks requires secure and save real-time data transmission. Signaling systems, switches and railway barriers also require a high level of operational safety. FIPSYSTEMS® product solutions offer excellent protection of cables and sensitive data lines against weather conditions, heavy rain, snow and ice, mechanical impacts and excellent protection against rodents.