

HIGH SPEED

Smart Quality for the Highest Speed
We Accelerate the Future



SAFE AND INNOVATIVE SYSTEM SOLUTIONS FOR HIGH-SPEED TRAFFIC

A fast, environmentally friendly and comfortable journey between cities – that is both the wish and need of many people all over the world. Travelling by train is becoming more attractive in relation to air travel, above all on medium-length journeys, thanks to higher speeds and increasing frequencies. Stringent demands are however being made on modern rail infrastructure – due to speeds up to 350 km/h and over as well as due to the complex interaction between substructure, superstructure and vehicle. Issues such as safety and availability, as well as fast maintenance options, move into focus. As a technology leader voestalpine Railway Systems offers innovative, cutting-edge products with the expertise of a provider as well as trendsetting

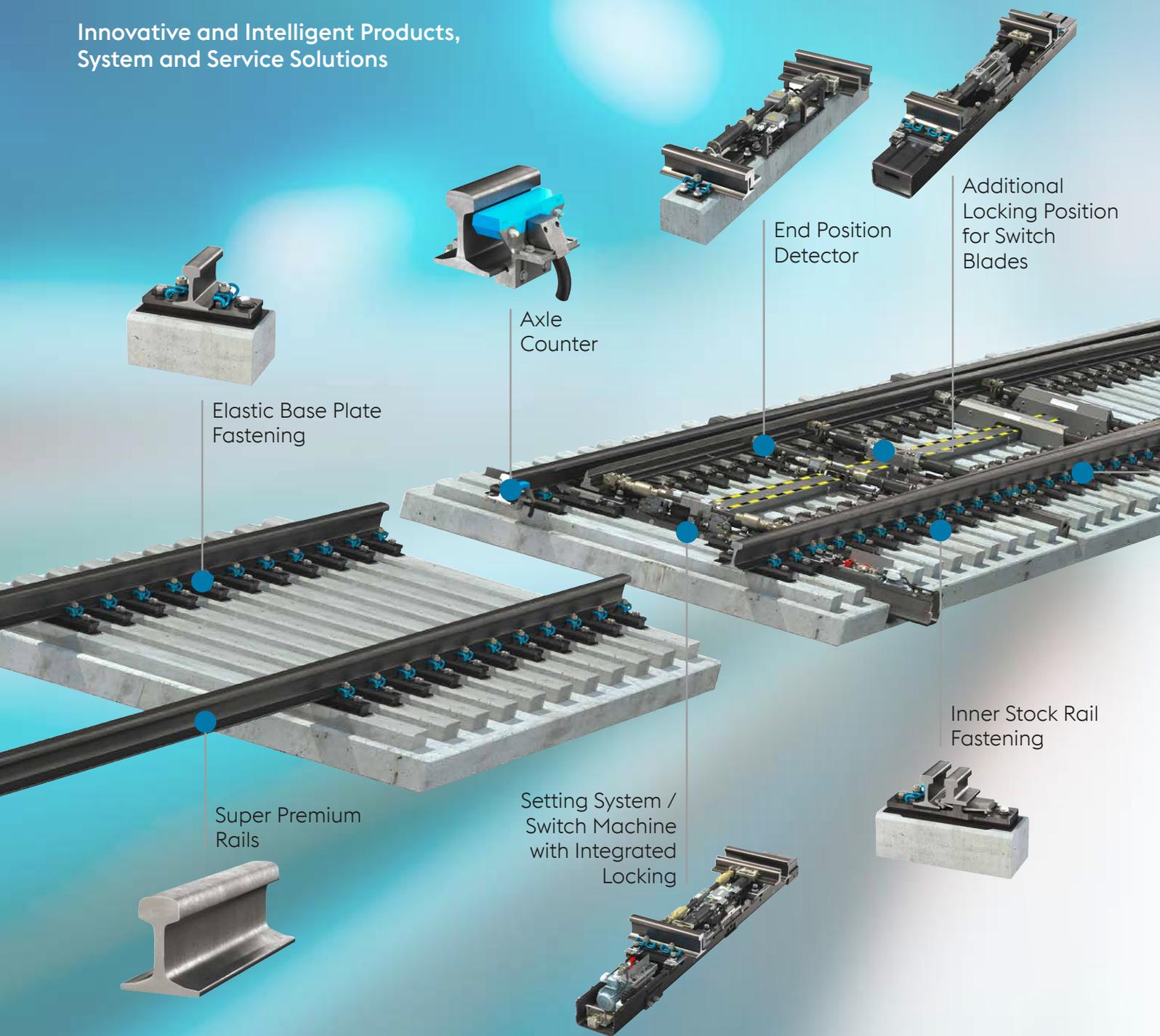
concepts. We thus improve service life, availability, reliability and ease of maintenance for rails, turnouts and signal technology on all continents – and under all climatic conditions.

A pioneer in the consideration of economic (LCC) and technical (RAMS) optimization potential, we bring together cutting-edge technology with systems expertise right down the line. voestalpine Railway Systems stands for overall solutions with maximum efficiency – so helping customers get ahead in terms of technology and competition.



RETHINKING HIGH-SPEED TRAFFIC SYSTEMS

Innovative and Intelligent Products,
System and Service Solutions



Options:



Alternative Plate Integrated Roller System



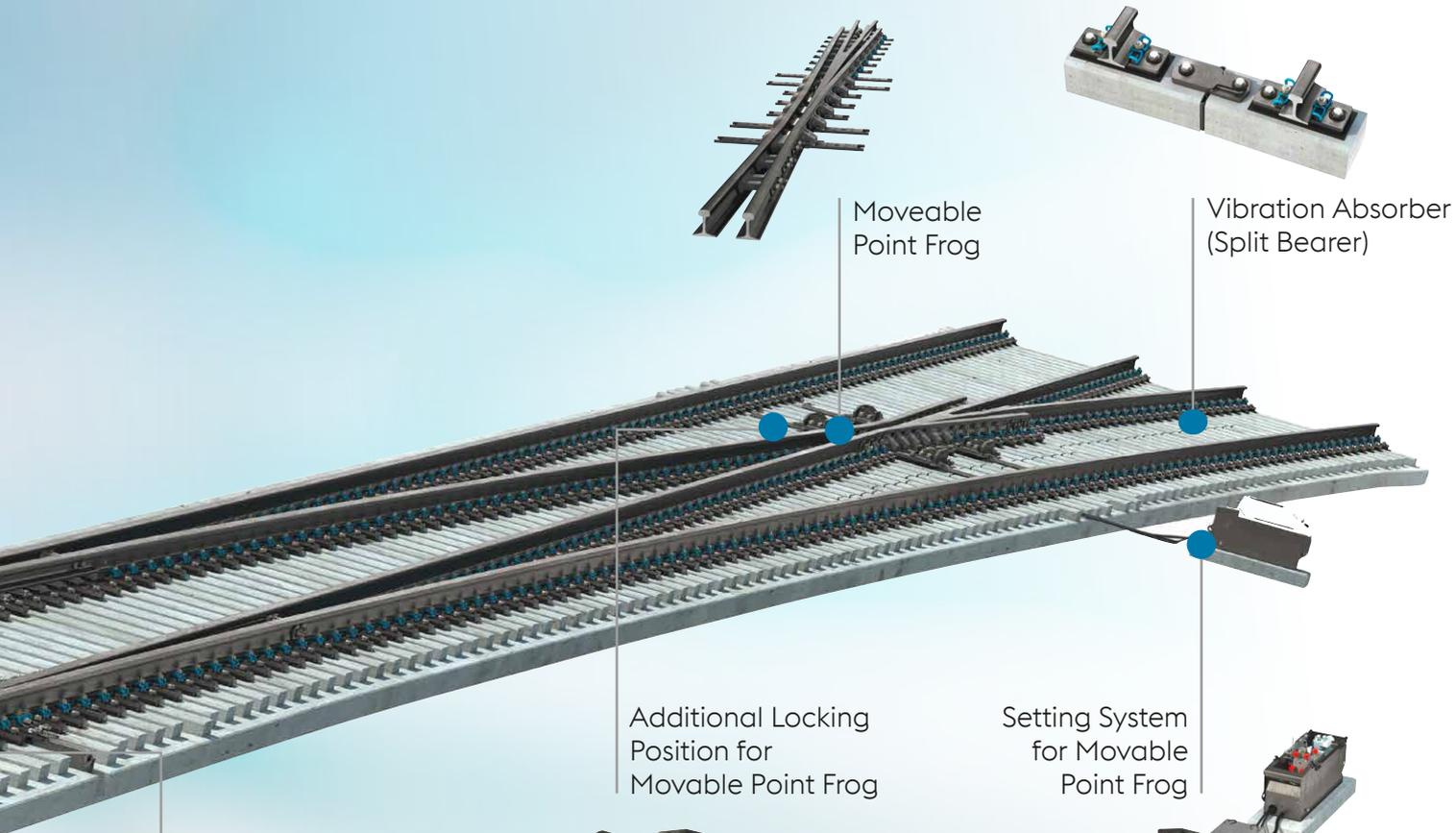
Point Machine with External Lock



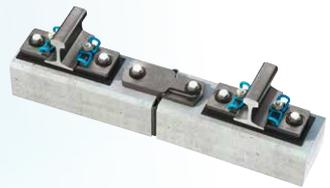
Mechanical Locking Device (Fully Encapsulated)



Mechanical Locking Device



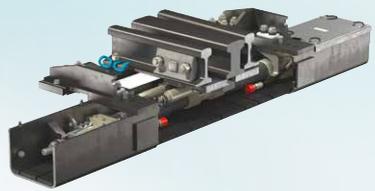
Moveable Point Frog



Vibration Absorber (Split Bearer)

Additional Locking Position for Movable Point Frog

Setting System for Movable Point Frog



Elastic Switch Roller System



Diagnostic and Monitoring Systems for Track, Fixed Assets and Rolling Stock



Insulating Joint



Rail Expansion Joint



Elastic Bridge Base Plate Fastening



Holding Down Device



HEAT-TREATED HIGH-PERFORMANCE RAILS



There is hardly a high-speed network in Europe without rails from voestalpine. For example, the world's longest railway tunnel, the Gotthard Base Tunnel with a length of 57 km, is equipped with our 120 m rails and our high-speed switches. The 50 km Eurotunnel, linking France with Great Britain, was also supplied with heat-treated rails from voestalpine.

Thanks to their resistant, fine pearlitic microstructure, heat-treated rail steel grades are ideal when it comes to combating damage mechanisms occurring in curves on high-speed routes. The globally patented HSH® heat treatment technology provides the rail head with maximum resistance to rolling contact fatigue while also maximizing endurance in the rail foot, in addition to optimum weldability due to the non-alloy steel design of HSH® rails. There are no limits to the range of applications. Manufactured in lengths up to 120 m, HSH® rail steel qualities are available in almost 100 different sections.

Added Value for You:

- » High resistance to rolling contact fatigue (RCF)
- » High straightness and flatness over the entire life cycle (resistance to wear)
- » Excellent weldability
- » Significant reduction in rail maintenance costs
- » Marked increase in service life in the track
- » Clear drop in life cycle costs

MODERN TURNOUT TECHNOLOGY FOR FASTEST RAILROADS



Fast connections between cities and optimum links to public transport mean that modern high-speed trains are a serious alternative to air travel and private transport. Given the growing environmental awareness and the trend in energy prices, today's high-speed technology offers huge potential. Speeds of almost 400 km/h and diverging speeds exceeding 200 km/h make stringent demands, but can be mastered safely and comfortably today thanks to state-of-the-art turnout technology.

Innovative Products and System Solutions for Maximum Requirements:

- » System turnouts
- » Optimized switch devices (FAKOP: Kinematic Gauge Optimization)
- » Movable point frogs in customized versions
- » Highly elastic base-plate / fastening systems
- » Rail expansion joints, including for extreme expansion lengths
- » Concrete sleepers
- » Extensive service package

Added Value for You:

- » System expertise and responsibility / everything from a single source
- » Comprehensive international references and experience
- » In-house rail production enables global product optimization
- » Experience with all track systems (slab track, etc.)
- » Innovative switch blade geometries for reduced wear and greater ride comfort
- » Optimized component design (reduced pickup jolt, lower lateral acceleration)
- » Elasticity adjustable thanks to highly elastic fastening systems

INNOVATIVE SETTING, SIGNALING & MONITORING TECHNOLOGIES



Innovative Modular Setting and Switching Systems as well as Monitoring Devices

Years of experience and extensive knowledge about turnout systems allow us to offer innovative solutions which satisfy the requirements in the high-speed rail sector.

- » Complete setting systems, point machines (with/without integrated locking), locking systems, end position detectors and
- » Point heating, axle counters and wheel sensors

Intelligent Monitoring and Diagnostic Systems

Cutting-edge technologies allow voestalpine to offer fully digitized smart monitoring in the following areas:

- » Monitoring of track systems and fixed infrastructure assets (incl. turnout diagnosis, monitoring of track movement or track circuit)
- » Monitoring of rolling stock (incl. monitoring of box and brake disk temperature, wheel defects, train profiles or environmental conditions)

The direct recording of the asset condition and assessment of targeted information through our Central Management Software, allows optimized asset management, efficient maintenance planning and to avoid unnecessary preventive maintenance.

Added Value for You:

- » Compatible with a wide range of interlocking technologies
- » Encapsulated components
- » Minimized space requirement
- » Can be retrofitted
- » Extended inspection intervals and optimized asset management
- » Modular diagnostic platform and planning instrument
- » Integration in higher-level systems possible

TRACK SOLUTIONS – OUR EFFICIENT TRACK MANAGEMENT LEADS TO OPTIMIZED PERFORMANCE AND COSTS

From the idea to implementation, from training to consulting, from products via logistics to maintenance – with our Track Management for HIGH SPEED we offer an extensive portfolio of services. They not only ensure great ride comfort at high running speeds, but also satisfy the requirements in terms of safety and quality. We stand for customized product and service solutions with minimized life cycle costs. We analyze the needs of our customers and recommend the best technical and most cost-effective solution for rails, turnouts and systems based on precise calculations.



PREPARE

CONSULTING, ENGINEERING & TRAINING

150 engineers are hard at work all over the world, developing specific solutions for our customers – from the planning, development and engineering phase through assisting with installation to optimizing maintenance strategies. At our academies we share our knowledge with customers in the framework of seminars and in-house training programs.



START

SUPPLY, LOGISTICS & INITIAL SERVICE

With our customized availability concepts and just-in-time logistics chains we supply our customers with the railway construction materials they need. Our initial services not only guarantee maximum installation quality – they also pave the way for reduced follow-up costs and an increased service life.



RUN

SMART MAINTENANCE SOLUTIONS

Maximizing availability, minimizing operating costs – those are the strategic objectives of our customers. Thanks to our combined product and service expertise we carry out preventive and corrective maintenance independently: Our service even includes processing scrap materials at the end of the life cycle.



PERFORM

TRACK MANAGEMENT

You want to concentrate on your business and ask capable partners to look after your railway infrastructure? We're the people for the job! Our Track Management with electronic diagnostic systems allows you to plan maintenance. So cutting costs – and guaranteeing high levels of availability.



Disclaimer:

The information published in this document, in particular but not limited to, procedures, processes and any other information is subject to explicit confidentiality. Any manner of reproduction, processing, distribution, storage or any manner of utilization shall require the prior written consent of voestalpine Railway Systems GmbH. The information in this document was created with the greatest possible care and to the best of our knowledge and belief. voestalpine Railway Systems GmbH nevertheless accept no guarantee for the applicability, completeness and correctness of any information contained in this document.

Version 3