



RAILWAY
SYSTEMS
by voestalpine

URBAN TRAFFIC: TRAM

At the Pulse of the Cities –
We Create Connections



LOW-NOISE AND AVAILABLE SYSTEM SOLUTIONS FOR PUBLIC TRANSPORT

All over the world the trend towards urbanization draws more and more people to the big city, and the demand for public mobility is growing. Tram operators are constantly confronted with new challenges: ever-increasing interval times resulting in higher requirements, complex framework conditions for maintenance in the public sector, as well as the wish for environmentally friendly, comfortable and low-noise solutions. This background above all means we need functioning systems that guarantee safety while catering for today's demands on mobility.

As the global market leader, voestalpine offers innovative and reliable 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. Over 150 tram networks are supplied with our products all over the world, successfully coping with increased requirements day in day out, thanks to first-class technologies.

A pioneer in the consideration of economical (LCC) and technical (RAMS) customer benefit, we bring together cutting-edge technology with systems expertise right down the line. Our some 60 sites worldwide let us bundle our knowledge and supply customers with localized products and services tailored to their needs and offering added value. voestalpine stands for overall solutions with maximum efficiency – so helping customers get ahead in terms of technology and competition.

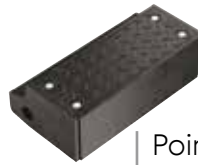


RETHINKING URBAN TRAFFIC SYSTEMS

Innovative and Intelligent Products,
System and Service Solutions



Point Machine with
Internal Locking

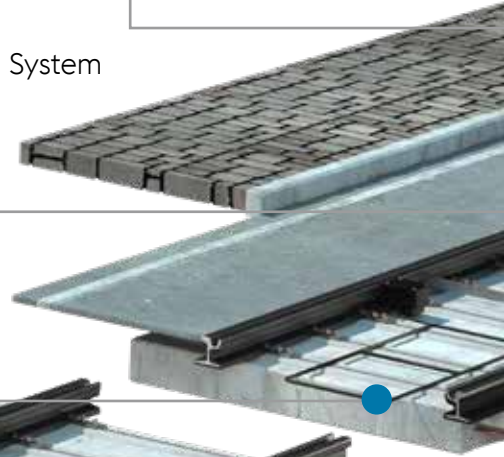


Point Heating Control System

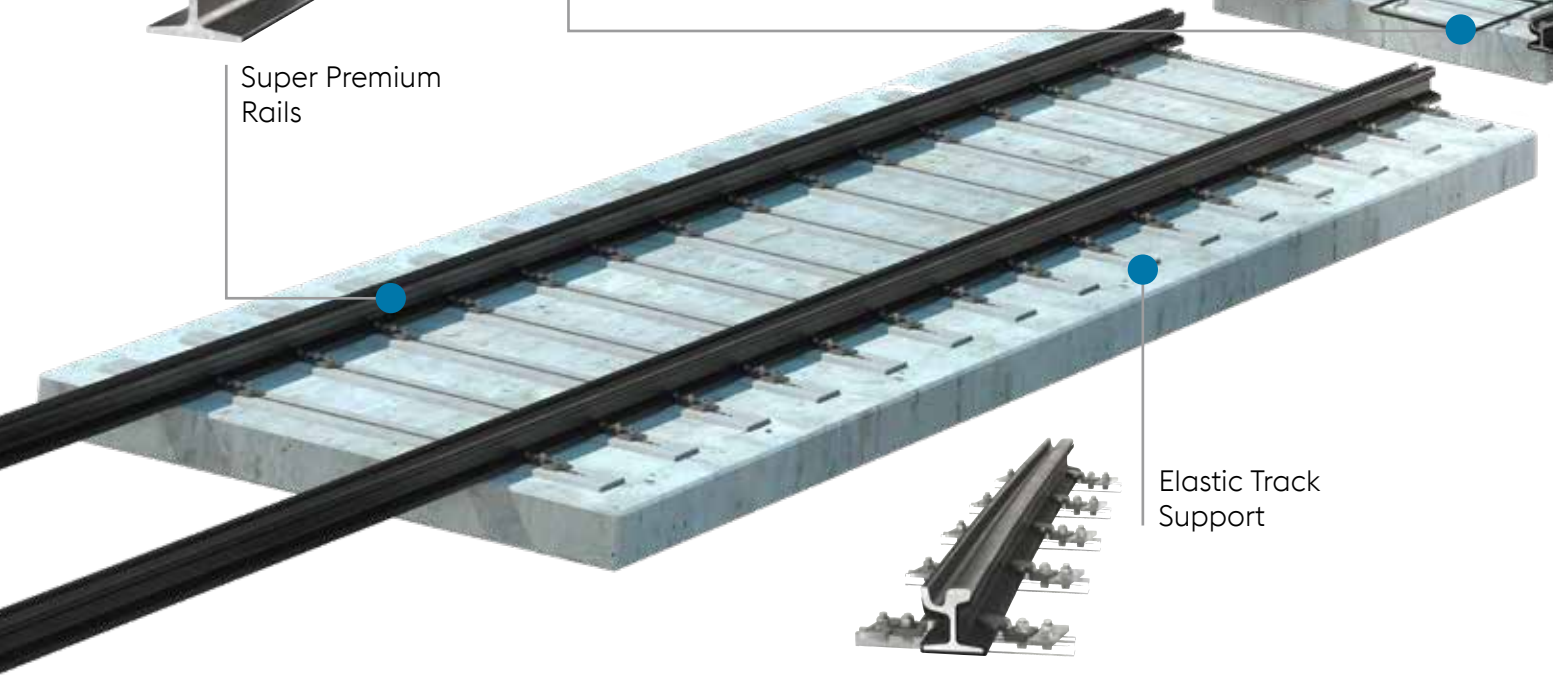


Super Premium
Rails

Vehicle Communication



Elastic Track
Support



Options:



Axle Counter



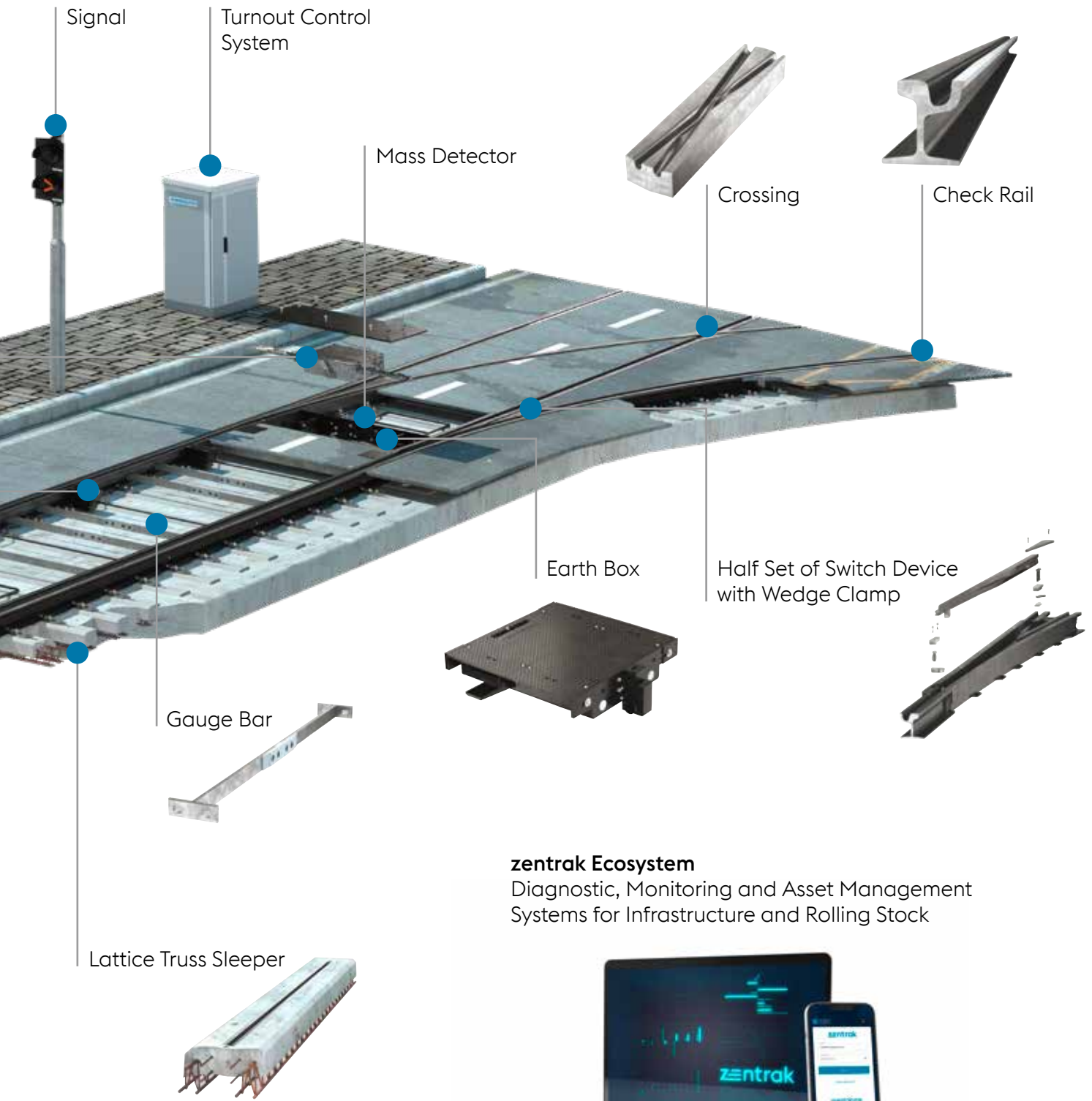
Alternative Rail
Fastening System



Manual Point Machine



Rail Foot
Clamp



zentrak Ecosystem

Diagnostic, Monitoring and Asset Management Systems for Infrastructure and Rolling Stock





UNIQUE HEAT-TREATED GROOVED RAILS: FROM R290GHT (-CL) TO 400GHT®



We are the global market leader for grooved rails and the only manufacturer of heat-treated qualities in this segment. Our customers include almost all major tram operators in Europe, as well as numerous other important companies based in North and South America, Australasia and Africa. Our portfolio contains heat treated grooved rail solutions ranging from the easy to deposit weld 290GHT-CL, the grades R290GHT and R340GHT to the extremely wear resistant grade 400GHT®, thus representing optimized rail solutions for all track maintenance strategies of our customers. All our qualities benefit from HSH® heat treatment technology. HSH® grooved rails with high wear resistance are mainly used for curves on tram tracks subject to heavy-duty service:

- » The 400GHT® as a “put-in-&- forget” solution with longest service life at lowest maintenance requirements.
- » The R290GHT, which offers optimum metallurgical conditions for the build-up welding strategies of our customers (reprofiling in the track), is also available as 290GHT-CL with an extra-low carbon content of max. 0.50 %.

As regards joint welding in the track, tried and tested standard processes and procedures are available for all grooved rail steel grades produced by voestalpine Rail Technology. On customers demand all our grooved rails are also available pre-curved according to bending plan. With the aim of synergistically maximizing customer benefit, these rails are of course also used in voestalpine's turnouts.

Added Value for You:

- » Maximum wear resistance for a significantly longer service life in the track
- » Effective defense against rail corrugation
- » Simple to weld – combined with on-site welding advice provided by voestalpine's experts as a service to customers
- » Available in all sections to EN as well as special customized sections
- » Manufactured according to bending plan and drilled for use with gauge bars
- » Tightest tolerances
- » First-class surface quality

SUSTAINABLE TURNOUT SYSTEMS FOR URBAN TRAFFIC

The constant further development of grooved rail technology means we are not only able to offer customers innovative and efficient solutions, but also to optimize them in line with the ever-increasing demands on public infrastructure. If we are to meet the growing need for mobility, first and foremost in conurbations, to optimum effect, special high-performance, economical, environmentally compatible and convenient system solutions are required. We work hand in hand with customers to develop concepts which fulfill individual needs and circumstances to optimum effect. Our products, which are optimized in terms of life cycle costs, promise maximum availability, reliability, ease of maintenance (robust design), as well as short installation, replacement and track possession times due to the use of pre-assembled parts, in addition to efficiency and durability.



Innovative Products and System Solutions for Maximum Requirements:

- » Intelligent grooved rail system turnouts
- » Complex systems and special solutions
- » Ladder track
- » Optimized switch blades
- » Welded design
- » Monoblock design
- » Cast design
- » Wide range of designs for crossings
- » Replaceable crossings
- » Expansion joints
- » Top-on-track turnouts
- » Rail encapsulation
- » Track guiding analysis and safety studies
- » Extensive service package

Added Value for You:

- » System responsibility / everything from a single source
- » Years of extensive experience on all continents
- » Wide-ranging design options, even for the most demanding applications
- » Integrated rail and welding expertise
- » Individual solutions for materials with high wear resistance
- » 'Green' lubrication-free components
- » Maintenance-optimized products
- » Expertise and in-house manufacture of rail encapsulation systems (insulation against vagrant electric current)
- » Easy to weld for repair
- » Compatibility with all laying and fastening systems
- » Guaranteed industrial quality maintained from first to last day in the track
- » "Put-in-and-forget" solutions for grooved rails

INNOVATIVE SETTING, SIGNALING & MONITORING TECHNOLOGIES



Innovative Turnout Setting Systems and Monitoring Devices

Years of experience and extensive knowledge about turnout systems allow us to offer innovative solutions for efficient, sustainable operation on urban traffic routes.

- » **Electrical and manual turnout setting systems**
- » **Turnout control systems and point heatings, 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 wheel defects, weighing in motion or acoustic bearing detection)**

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

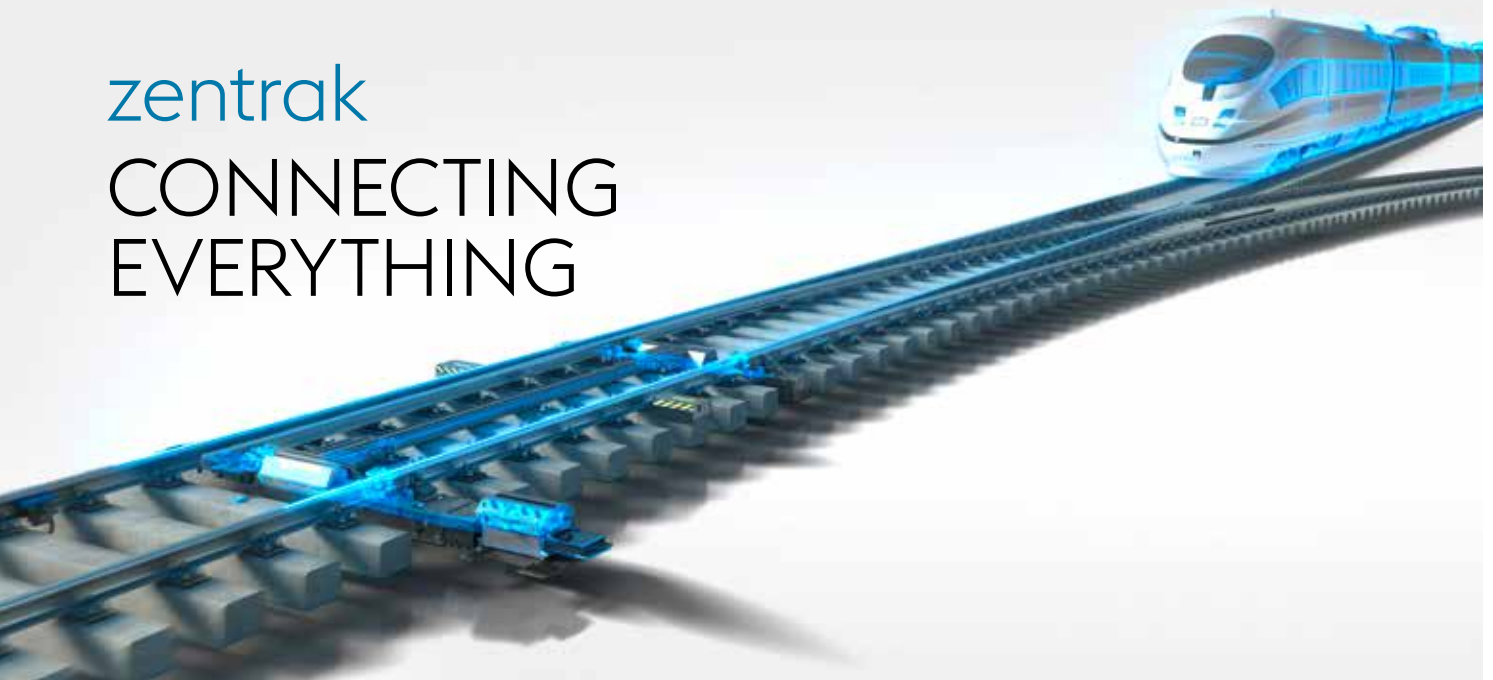
Added Value for You:

- » **Compatible with a wide range of interlocking technologies**
- » **Low noise levels**
- » **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**

zentrak

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CONNECTING EVERYTHING



THE INTELLIGENT, CONSCIOUS AND LIVING RAILWAY ECOSYSTEM

Your railway network keeps the world moving forward: but your infrastructure is only as strong as the technology that holds it together. That's where zentrak comes in: our intelligent, living railway ecosystem enables you to create and manage the most efficient, reliable, and high performing railway track assets in the world.

zentrak's three modules Rolling Stock Monitoring, Infrastructure Monitoring, and Asset & Maintenance Management combine as a catalyst for cost effective digitalization and sustainable, long term growth: building a future in which your railway network thrives intelligently.

Infrastructure Monitoring

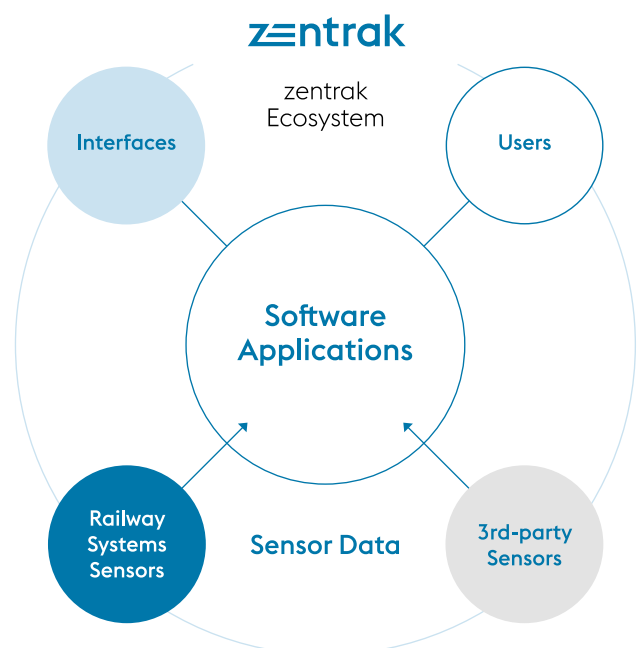
- » Continuously records the condition of your infrastructure
- » Enables proactive condition-based maintenance for maximum availability and the lowest lifecycle costs

Rolling Stock Monitoring

- » Provides a variety of measurement technologies
- » Enables the combination of individual site diagnostic and monitoring functions at a single location
- » Software applications for real-time analysis, interpretation, and presentation of diagnostic results

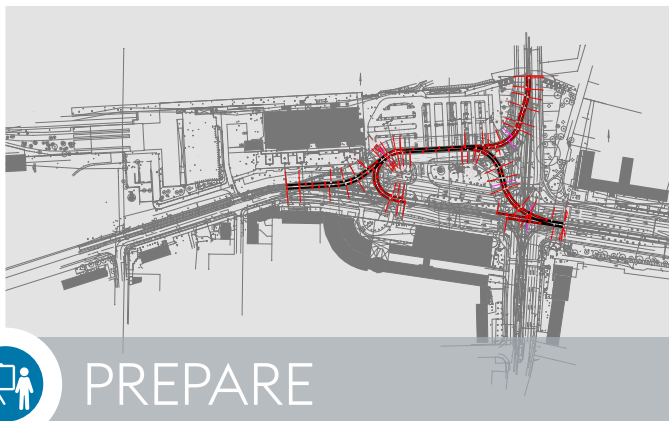
Asset and Maintenance Management

- » Allows you to manage your assets throughout their entire lifecycle
- » Supports data-driven decisions such as investments and improvements
- » Provides the foundation for a dynamic maintenance strategy



LIFE CYCLE 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 Life Cycle Management for URBAN TRAFFIC TRAM we offer an extensive portfolio of services. They not only ensure great ride comfort at increasing interval times, 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 ensuring high levels of availability.



LEADING THE WAY IN SUSTAINABLE RAILWAY INFRASTRUCTURE

At voestalpine Railway Systems we take our social and environmental responsibilities seriously. As the global leader for railway infrastructure system solutions, we understand the impact our products have on society and the environment.

We are dedicated to providing durable solutions that enable the operation of sustainable transport systems. Our commitment to ethical and legal conduct is governed by the voestalpine Code of Conduct, ensuring impeccable actions throughout our company and supply chains.

Why we need Sustainable Mobility Solutions

The need for sustainable mobility solutions has never been more pressing in a world shaped by urbanization, digitalization, globalization, and demographic shifts. As the demand for mobility driven by these megatrends continues to grow, it is imperative to address the challenges of climate change and resource depletion head-on.

Our Commitment to Eco-Friendly Railway Infrastructure Solutions

We are proud to be at the forefront of providing sustainable railway solutions that promote environmental stewardship, ensure longevity, and adhere to the highest industry standards.

Our focus on sustainability is built on three foundational pillars:

» greentec steel

Our revolutionary greentec steel initiative is at the heart of our environmental strategy. By pioneering new steel production methods, we significantly reduce CO₂ emissions, contributing to a greener planet.

» Longevity Solutions

Our products are designed for durability and resilience, ensuring they stand the test of time. By extending the lifespan of our railway infrastructure components, we reduce the need for frequent replacements, thus conserving resources and minimizing environmental impact.

» Certified Responsibility

We adhere to rigorous certification processes that validate our commitment to environmental and social responsibility. These certifications ensure that our practices not only meet but exceed industry standards, reflecting our unwavering dedication to sustainable development.



Visit us online

voestalpine Railway Systems
www.voestalpine.com/railway-systems

voestalpine
ONE STEP AHEAD.