

URBAN TRANSIT



# RAIL.ONE – THE WAY TO GO

We develop innovative track systems, to help you get ahead – fast and safely. And what are your plans?

## **YOUR OBJECTIVE IS OUR CHALLENGE**

RAIL.ONE delivers innovative track systems for railway transport in Germany and around the world: we offer engineering, production, supply, logistics, and quality management – all on a one-stop basis. Our systems require very little maintenance over the course of time and allow stable track geometry and excellent ride comfort, even at high speeds and under extremely rigorous conditions. And since every track should be optimized for its special operational areas, RAIL.ONE places special emphasis on close collaboration with customers and business partners. With its extensive sales network – as well as locations in Germany, Europe, America, and Asia – RAIL.ONE occupies a leading position in track-system technology and in the manufacturing of concrete sleepers. Continuous research and further development assure our technological lead.

## **RAIL.ONE – DEVELOPMENT BASED ON EXPERIENCE**

RAIL.ONE has become well established as a comprehensively oriented systems and engineering provider for the entire field of railway track, with its great number and diversity of requirements. In the high-speed area, the company has achieved an internationally leading position. RAIL.ONE furthermore offers the production of concrete main-track and turnout sleepers. All of this means that RAIL.ONE, in close cooperation with customers and business partners, performs complete services for product development, manufacture, and application on a one-stop basis – beginning with engineering; including production, supply, and logistics; and extending to quality management.



# MORE LIVEABLE CITIES

Intelligent urban transit is part of the nervous system of the modern city. Mobility is more important than ever before, but new concepts are in demand. The first step involves communication – let's talk about what you need.

## **BETTER ON THE WAY, FASTER TO YOUR DESTINATION**

Increasing traffic volume, traffic jams, nervousness, and insufficient parking space all place greater demands in our cities on urban transit. An increasingly interlinked society expects great degrees of mobility and flexibility from each of us. Only an intelligently interlinked public transport system guarantees smooth traffic flow. In addition, it has become increasingly important that our cities represent attractive areas worth living in. Architects and planners are searching for holistic concepts for urban design. These also include urban transit infrastructure and track systems – since they are especially important as aspects of harmonious urban landscapes. Advanced urban-design developments have proved that existing infrastructure and new visions can be successfully combined.

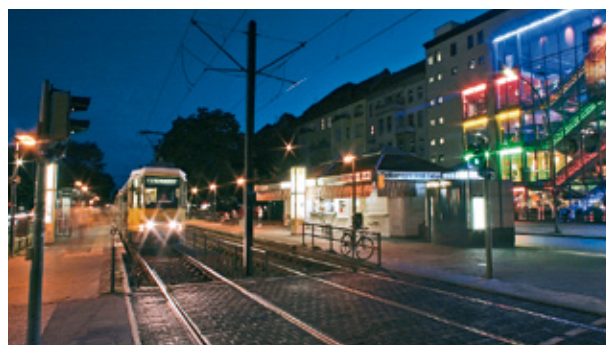
## **ALWAYS ON THE GO**

With their new concepts, the attractiveness of trams, underground rail, and commuter trains is greater than ever before. Innovative solutions are in demand, and the search for new products and production methods must be continuously promoted. In urban transit, safety above all, cost-effectiveness, and environmental friendliness enjoy highest priority. And here is where RAIL.ONE goes into action. In addition to product optimization, communications plays a key role – especially in urban transit, where each construction project must also undergo critical evaluation by politicians and the public. High quality standards are likewise essential, and cost planning represents binding commitments. In the end, public transport authorities and municipal offices decide on the feasibility of a construction project.



### **WE HAVE UNDERSTOOD WHAT IS REQUIRED**

As system provider, RAIL.ONE is at the interface between public transport authorities and planners. Visionary construction projects demand far more than merely the delivery of hardware. RAIL.ONE accordingly understands its mission as a service and competence provider. Leadership in technology is assured not only through advanced production facilities and innovative process technology, but also primarily through experience and know-how in engineering. The strict quality criteria of public transport authorities play a decisive role here – and, with respect to safety, innovation, reliability, profitability, aesthetics, comfort, and environmental friendliness – RAIL.ONE is ready indeed for the rail track market of the future.



# SYSTEMATICALLY TOWARD SUCCESS

Which track system is the best for you? Every project places new challenges for planners and engineers. But for every problem there is a solution – and we'll help you find the best way.

## URBAN TRANSIT MEANS CUSTOMIZED SOLUTIONS

The planning of a project for urban transit requires consideration of a great number of factors. The constant coexistence of people, means of transport, and other machines in crowded spaces demands intelligent and sensitive solutions – not only in planning and logistics, but likewise during construction phases and during transport operation. A track system by RAIL.ONE is always a customized solution: each system is optimized according to special requirements. Urban architecture, bridges, overpasses and tunnels, impressive squares, train stations, malls, and shopping centres exert critical influence on the selection of systems. What physical forces and environmental influences demand our consideration? How do structures near a rail line react over the long term to rail operating loads, and how should we protect them? What logical requirements must be considered during the construction phase? Optimization of the process chain indeed enjoys top priority, including transport routes and supply of material.

## AN EYE ON THE ENVIRONMENT

As future-oriented means of transport, urban transit involves great responsibility with respect to our environment. Urban-transit infrastructure must observe strict limit values for airborne noise and vibration, especially in densely populated areas. In such cases, innovative mass-spring systems and noise-absorbing rail products assure good neighbourliness. These systems must likewise conform to regulations for the electrical insulation of railway track. In addition, it is now increasingly expected that such track systems satisfy aesthetic expectations, particularly in mid-town areas. An attractive as well as sustainable solution is possible in the form of RAIL.ONE "Green Tracks" ATD-G and RHEDA CITY GREEN. They enable creation of additional vegetated areas that enhance the attractiveness of the entire urban landscape – and at the same time contribute to improvement of the microclimate. Reduced noise emission, capture of fine particulate matter by the vegetation cover, as well as retention and faster evaporation of rainwater – with the resulting relief of the urban storm-sewage systems. All of this means benefits for everyone involved: residents in the vicinity, passengers, the transit authorities, and the entire municipality.

## EVERYTHING ON A ONE-STOP BASIS

The reliability of track systems plays a critical role in urban transit. Great availability and low maintenance costs enjoy top priority among passengers and system operators. To achieve this goal, expertise gained over long years as well as comprehensive quality assurance are essential throughout and beyond all phases of the project – especially during track installation work. RAIL.ONE accepts this responsibility and offers all services on a one-stop basis – beginning with consulting and planning, including delivery and installation of track components, and extending to system supervision. This comprehensive offering ensures satisfaction of stringent quality standards for the development, planning, and construction of such systems. In addition, RAIL.ONE transfers precious know-how for technologies, installation techniques, staff training programmes, and quality assurance, in order to promote consistently high quality in its projects throughout the world. RAIL.ONE has gained extensive experience from more than 50 years of sleeper production. It furthermore accumulates expertise from its many successfully executed projects and has integrated it into new solutions according to the motto, "Our experience grows, because we share it."





### ALL SYSTEMS AT A GLANCE

When requirements go beyond conventional ballasted systems, RAIL.ONE has the appropriate solution for all requirements of urban transit. In addition to operating speed and axle load,

many additional factors are essential in selection of rail systems. Among these factors, long-term availability and maintenance costs play increasingly significant roles.



# FLEXIBLY THROUGH THE CITY

Now as before, concrete sleepers on ballast represent the primary basis of track construction, in Germany and around the world. Not surprising, we believe: the system is simple, but hard to beat.

**The main advantage of prestressed-concrete sleepers is their flexibility.** For newly constructed lines or the upgrading of existing tracks: these sleepers offer fast and reliable solutions for any application. They support all gauges common in urban transit, as well as all rail profiles (Vignol or grooved).

Elastic or rigid structural support of rails, as well as special applications, are all possible. RAIL.ONE has developed the two system types TBS and LIS especially for applications with tram systems, surface commuter trains, and underground railway systems.



**TBS AND LIS SLEEPERS: A CLEAN SOLUTION** Convenient production and assembly, long life-cycle, and the absence of impregnating agents all make the concrete sleeper an environmentally friendly and long-term, cost-effective solution.

**IT DOESN'T GET ANY SIMPLER** Prestressed-concrete sleepers can also be produced and delivered quickly and in great numbers. Their simple assembly and installation guarantee an extremely high level of availability for the rail line.





## THE BENEFITS OF TBS AND LIS CONCRETE SLEEPERS ON BALLAST

- Full performance capability, even with high operational loads
- Cost-effective optimization of the track system, with simultaneous maintenance of technical durability, reliability, and safety
- Differentiated solutions, customized to match individual fields of application and the user's particular requirements
- Assurance of operational continuity
- Focussing on a maximum of possible technical innovation
- Preassembly of the rail fastening systems at a sleeper production plant, with attached rail-fastening devices, and with delivery to the construction site ready for installation
- Possibility of enhancing track elasticity by modular extension with special intermediate and sub-layers
- Modified sleepers for auxiliary rails offer solutions for guide and check rails

# RELIABLE, INVISIBLE, AND SIMPLY FLAWLESS

A prime advantage of this track system is that you can't see it. These ballastless track systems require almost no maintenance, offer superior ride comfort, support heavy loads, and ensure great safety. We have faith in hidden values!

**RHEDA CITY functions according to the same principle of all systems from the RHEDA family.** The RHEDA CITY system was, however, designed especially for urban transit, and is especially effective in applications for tramways and surface commuter train lines. RHEDA CITY is characterized by simple structural technology: modified bi-block sleepers with lattice trusses facilitate installation and guarantee exact track gauge at the same time. The monolithic structure of the concrete track-supporting layer, and the low structural height of the track system enable further advantages. Application of RHEDA CITY models does not end with through-track sections: turnouts can be effectively integrated with the same technology. As required, the system can be covered with asphalt, concrete, or paving stones. The newest model offered is the grassed version of the RHEDA CITY system. For more information, please consult the following pages.

**The RHEDA MRT ballastless track system was developed especially for applications in underground and in surface commuter systems.** Its basic principle is the same as that of the top product from RAIL.ONE, the RHEDA 2000®, the track system designed for high speeds. RAIL.ONE has, however, adapted the individual components of the RHEDA MRT to meet the requirements of urban transit. This means, for example, significant reduction in its installed structural height and in its weight. Additional special characteristics of the RHEDA MRT include its monolithic type of construction, and its use of concrete bi-block sleepers. A special sleeper type provides third rail support plug-in inserts as an integrated sleeper design. The system can also be executed as a light or heavy mass-spring system. For RHEDA MRT as well, turnouts represent no problem: RAIL.ONE offers effective turnout solutions in conformity with this system.



**RHEDA CITY: THE SAFE WAY TO GO** As a ballastless track system, RHEDA CITY can be optimally integrated into traffic flow: trams, buses, cars, and pedestrians all share the same trackway. The system can be covered with asphalt or other paving material, as required.



**RHEDA MRT: 100% PERFORMANCE** Its "big brother" for high-speed applications, the RHEDA 2000®, served as the inspiration for development of this lighter variation for underground and surface commuter systems.



## THE BENEFITS OF RHEDA CITY AND RHEDA MRT

- Flawless track positioning
- Great precision of gauge and track geometry as a result of the cross sleeper
- Monolithic construction as a result of optimized track system design with superior bonding quality
- Elastic support of the rails, with continuous support for RHEDA CITY tracks if required
- Simple, transparent system structure
- Great levels of safety and long service life
- Conformity with requirements for electrical isolation

# ON GREEN TRACKS THROUGH THE CITY

Why take a long trip in search of Mother Nature? Let us bring her downtown for you! After all, we expect urban transit to be not only environmentally friendly: it also makes life in the city a little more worth living. Your eyes will also enjoy.

**RAIL.ONE offers various ballastless track systems as green tracks: the ATD-G and the RHEDA CITY.** Both models are especially designed for public mass transit infrastructure. These systems are particularly effective in applications for tram networks, and for light- and heavy-rail suburban passenger lines. The characteristic feature of the ATD-G system is the asphalt supporting layer with bi-block concrete sleepers installed directly onto the asphalt layer. The track panel is fixed in place by a transverse-force base. The RHEDA CITY GREEN system is the vegetated variation of the RHEDA CITY ballastless track.

Here as well, modified bi-block sleepers with lattice girders are used. The monolithic structure and the low structural height guarantee perfect track positioning and a maximum of safety. The major advantages of both systems are the appealing optical impression, and the favourable environmental properties. Both ATD-G and RHEDA CITY GREEN can be covered with turf or sedum vegetation.



**GREEN LIGHT FOR THE TRAMWAY** Both the ATD-G and the RHEDA CITY GREEN models can be installed with conventional equipment for street and track construction. The small number of working steps in laying the track enable fast construction work.



**POWER THROUGH PEACE AND QUIET** Green track chamber elements prevent the vegetation from growing completely up to the rails. A simultaneous effect is reduction of airborne noise emission.



## THE BENEFITS OF ATD-G AND RHEDA CITY GREEN

- Creation of additional green surfaces
- Reduction in the emission of airborne and structure-borne noise
- Permanent stability of the track position, and long life-cycle
- Simplicity and transparency in system structure
- Flexibility in layout of the line
- Ease of installation by a high degree of mechanization
- Short construction time, low maintenance costs, and high levels of availability
- Only slight disturbance of motorized individual traffic during construction, for ATD-G uni-directional track installation is possible
- Modular adaptation to a variety of structural forms
- Effectively suitable in applications for both main-track as well as turnout systems
- Great resistance to corrosion caused by parasitic current

# RAIL.ONE – YOUR ONE-STOP PROVIDER

We offer a broad portfolio of products and services involving all aspects of railways and infrastructure, tailored to individual requirements.



### RAILWAYS



For construction of track systems and for the upgrading of existing rail lines, RAIL.ONE develops track solutions individually matched to the customer's requirements: and RAIL.ONE offers all these services on a one-stop basis. In the field of high-speed railways, patented RHEDA 2000® ballastless track technology has already achieved an internationally leading position. RHEDA 2000® has developed into standard technology for mainline routes with high-speed transport and heavy-haul conditions. In the classical market segment for monoblock sleepers as well, RAIL.ONE offers a unique product portfolio for all requirements.

### URBAN TRANSIT



Underground, surface, and tram rapid transit not only relieves metropolitan areas from the burdens of private vehicle traffic and assures tolerable living conditions in residential regions: it also contributes appreciably to reduction of emissions and energy consumption. For track installation on concrete, ballast, or asphalt, RAIL.ONE offers high-performance and reliable railway systems that are optimally integrated into their surroundings.

### FREIGHT AND HEAVY-HAUL



With high energy prices and increased demand for raw materials, freight and heavy-haul railway transport has assumed a key function in inter-modal competition. For these exceptional demands placed on track technology, RAIL.ONE has developed special concrete sleepers designed for static axle loads up to more than 40 metric tonnes.

### ENGINEERING



Requirements placed on the cost effectiveness of advanced track systems have become more demanding: engineering innovations are expected to assure the quality and the productivity of the overall system. Low maintenance expense and reduction of life-cycle costs will become increasingly important. For planning of all solutions for rail lines – whether at grade, over bridges, or in tunnels – RAIL.ONE engineers effectively adapt overall track design to local requirements: from the design development phase up to detailed planning.

### SLEEPER PLANTS



RAIL.ONE is the only planner and builder of track production plants to offer a choice among four specific production processes – which, in addition, can be modified according to special requirements. This combination of plant-facilities engineering and production expertise further guarantees the high quality standard required for all customers.



