

FREIGHT AND HEAVY-HAUL
TRANSPORT



RAIL.ONE – THE WAY TO GO

We develop innovative railway 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 established itself as a comprehensively oriented systems and engineering provider for the entire field of railway tracks, 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.



THE FUTURE OF FREIGHT TRANSPORT

Rail transport delivers freight to even the farthest reaches of the world – quickly, reliably, and economically in use of resources. The rugged innovations of RAIL.ONE meet all challenges and combine expertise with cost-effectiveness.

FREIGHT TRANSPORT AS ECONOMY FACTOR

Prospering sectors of the economy have one factor in common: a strong infrastructure – and a tightly-meshed transport network is an essential characteristic of high-performance regions. In addition, systematic expansion of infrastructure likewise represents a growth engine for expansion of the economy. At the same time, globalization of economic processes and liberalization of markets pose major challenges to the field of infrastructure, since the growing prosperity of emerging nations internationally ensures rising demands for products and for freight transport. On the other hand, resources are dwindling, and energy prices are rising. With its savings in raw materials and its cost-efficient solutions, rail freight forwarding is the transport concept of the future.

AT THE THRESHOLD TO THE FUTURE

With its ecological, economic, and performance-related dominance, the advanced concrete sleeper represents – with respect to a wooden sleeper – a qualitative quantum jump for all main-track and turnout zones of a rail network. Particularly with high speeds, great train frequencies, and heavy loads, the concrete sleeper with its greater intrinsic weight offers optimized position stability. An additional outstanding argument for the concrete sleeper is its durability: with its life cycle of around 40 years, it out-performs the service life of wooden sleepers. Under difficult environmental conditions – for example, in moist climates and in the desert – their material superiority is even more essential. Indeed: optimized concrete mix design can react to outside influences on a dedicated basis. This flexibility and a high degree of mechanization assure maximum reliability during installation. And the ecological factor should not be underestimated: owing to their content of impregnating agents and residue from rail operations, wooden sleepers must be treated as hazardous waste and require special disposal measures. Not only the railway operators but also the environment profits from the use of concrete sleepers.



WITH US, YOU CAN GO YOUR OWN WAY

On tracks from RAIL.ONE, you can also transport large amounts over long distances, in addition to compatibility with the environment and with resources. Our tailored concepts enable solutions to all problems that a project can create in the planning phase: What climate conditions prevail along the rail line? What underground conditions must be taken into account? What geographic circumstances play a role in route planning? What axle loads and top speeds are expected? What regional standards must be satisfied? We offer you spot-on solutions for your specific requirements. For the challenges of intermodal transport, RAIL.ONE has developed special concrete sleepers designed for static axle loads up to over 40 metric tonnes. They furthermore assure international applicability by the availability of various gauges.

ACTING REGIONALLY ALL OVER THE WORLD

In the same way that our products are adapted to individual country requirements, RAIL.ONE also becomes a solid part of each region. We consider our global commitment as a key contribution to promotion of regional economic locations, from various standpoints: with our high local production depth, we not only provide infrastructure with the latest state of the technological art, but also enable as employer and contractor important encouragement for local economic development. In addition, we transfer valuable expertise in technologies, advanced management methods, staff training, quality assurance, as well as efficient production processes for the region. With systematic creation of local added value, we contribute to further development and to strengthening of the domestic economy – just as we profit from existing know-how in the region: experience grows with such exchange. We employ experience from more than 50 years of sleeper manufacture – and we learn more every day by facing new challenges und taking advantage of the knowledge of our regional partners. We integrate this expertise into our solutions in line with our motto: “Our experience grows, because we share it.”

YOUR WAY IS OUR DESTINATION

From planning, through production, and on to delivery and consulting: a heavy-haul project gives rise to questions. In five steps we find the answer together with you: a tailored and comprehensive solution from RAIL.ONE – so that you are always one step ahead of your competition.



1. REQUIREMENTS

The first phase requires answers to fundamental questions:

- What axle loads, speeds, and train frequencies are expected for the planned line?
- Will the track be used only by freight trains, or will passenger trains also travel the route?

Whatever the specifications demanded by your project, we offer you a customized concept. Solutions “Engineered by RAIL.ONE” represent quality, track-position stability, and long service life.



2. SLEEPER SPECIFICATIONS

Insights obtained are then referenced to regional requirements:

- Which standards will apply to the project? Is engineering design desired according to leading European (EN) or American (AREMA) standards, or will other local standards and regulations apply?
- What specific requirements should be considered? For example, must extreme climate conditions or soil characteristics be taken into account?

Whether in the desert or in the jungle, or on sand or rock: as one of the world’s leading companies in the construction of railway track, our solutions push the limits.



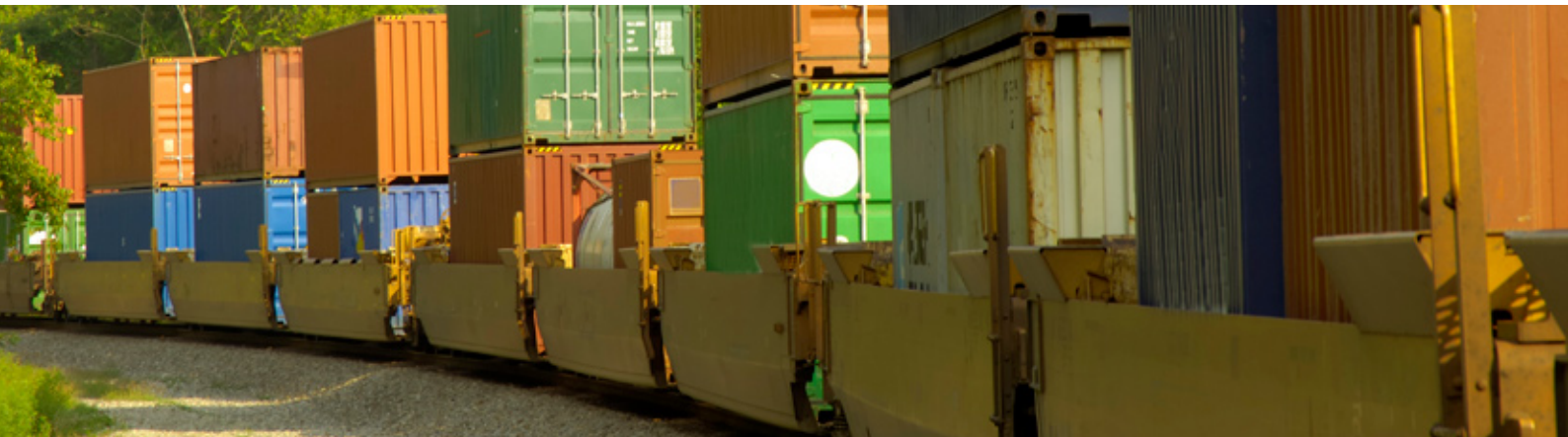
3. ENGINEERING DESIGN

A statement of requirements becomes a tailored solution. After definition of the customer’s specific needs, and the regional requirements, our developers and engineers prepare the required sleepers for production.

- RAIL.ONE designs the sleepers according to these requirements, defines the thickness of the concrete body, determines the required pre-stressing, and adapts the sleeper geometry to possible environmental conditions – for example, for possible sand drifts in desert regions.
- We calculate structural-engineering values: i.e., the forces, stresses, and deformations.
- According to the climatic conditions in the region of the routes, we define the concrete mix design.
- We adapt engineering design to match aggressive environmental influences – e.g., high salt content in the air near rail lines along a seacoast.
- In RAIL.ONE plants, the concrete, the structural engineering, and finally the complete sleepers are subjected to extensive tests.
- We apply for official approval testing in accordance with the testing programme specified by the applicable standard, or at qualified independent institutes if so requested by the customer, or by the respective national testing agencies.

Those who wish to go their own way do not take detours around problems: instead, they find the suitable solutions. Our engineering design does not fixate on obstacles – it recognizes the opportunity for innovation.





4. PRODUCTION

Ideas turn into products: we manufacture perfect-fit solutions “Engineered by RAIL.ONE” and in conformity with the most stringent quality standards.

- We offer our customers the entire portfolio of railway track systems for freight and heavy-haul routes, from sleepers for ballasted tracks up to the special solution RHEDA 2000® ballastless track system.
- On the basis of long years of experience in planning and building production plants, we offer our customers four specific production techniques, all of which can be individually modified according to special customer wishes.
- With our focus on economy and local added value, we design the production plant in accordance with the required output.
- With our production, we support the industry and the population of the region. With contracts to local companies, knowledge and technology transfers, as well as sustainable exchange of experience, our great regional production depth becomes an economic impetus for regional development.
- Our quality parameters are in accordance with German standards and with all applicable international standards, under the claim “Engineered by RAIL.ONE”.

The profitability of our freight routes depends above all on high train density and extreme axle loads – factors that place strict demands on the life cycle and the reliability of a track system. Our products take all external conditions, influences, and factors into account, and thus make a freight line an economic success story.



5. DELIVERY

From production, on through delivery, and up to logistics: RAIL.ONE always works spot-on:

- Just-in-time delivery, inventories, and production: our delivery plan is prepared in close collaboration with the customer.
- With our focus on cost efficiency, we plan and coordinate logistics concepts that guarantee delivery quality and reliability.

PURPOSEFUL, ADVANCED, PIONEERING

We develop track systems in five steps that deliver freight fast and safely to its destination. And our customers profit from our proven engineering, production, supply, logistics, and quality – all on a one-stop basis.

WE THINK IN LARGE SCALE DIMENSIONS

Not all sleepers are alike. And not all heavy freight is the same. International freight transport is also subject to constantly changing challenges. Each project poses its entirely individual requirements – from the topography of the region, including climate circumstances, up to expectations of the line operators with respect to performance and speed – and also with a view to further objectives such as environmental harmony and conservation of resources.



SAND, HEAT, STORMS:**HEAVY-HAUL SLEEPERS FOR SAUDI ARABIA**

Even in moderate climates, heavy-haul routes are subject to extreme demands. The requirements placed on a line in the desert, however, are even greater: there – in addition to heavy loads, high speeds, and great train frequency – extreme environmental effects must be taken into account. Sand drifts and storms, to be sure, have serious effects on the durability and the availability of a line. In order to assure the cost effectiveness and the service life of the line, preventive measures are necessary to avoid erosion of the sleepers by sand. RAIL.ONE has developed a solution that defies the most extreme regional climate conditions and offers maximum durability at top loads. With its solid concrete body and a particularly robust concrete mix design, the RAIL.ONE sleeper HHS 32.5 (AR 06) meets these demands.

THE NORTH-SOUTH LINE PROJECT IN SAUDI ARABIA

The kingdom of Saudi Arabia is the largest economy among the Arab countries. By winning an order for delivery of main-track and turnout sleepers for the North-South Line project, RAIL.ONE succeeded in entering this important growth market in 2007. The company also won the follow-up order in February of 2010 for the next section of the 2,400-km line, which will connect the mining areas in the northwest of the country to the port city of Dammam. There the track is designed for freight trains with axle loads up to 32.4 metric tons and at speeds of 110 km/h – as well as for passenger trains with axle loads of 30 tonnes at 160 km/h.

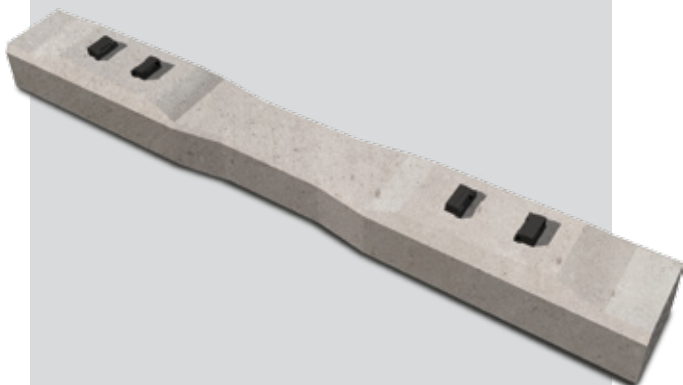
But it is not only speed and axle load that must be considered for this project – because the North-South Line passes through the desert. Owing to these extreme environmental conditions, RAIL.ONE especially developed the sleeper HHS 32.5 (AR 06) for this project. In the newly built plant in Hail, Saudi Arabia, approx. 1.7 million main-track sleepers of this type, as well as 78,000 linear metres of turnout sleepers, will be produced before completion of this project. The greater pre-stressing of this sleeper type makes it ideal for the great operational requirements that a combination of passenger and freight traffic entails.





USA HHS 44/8

PARAMETERS	UNIT
Permissible axle loads	44 t
Maximum speed	200 km/h
Weight (without fastenings)	400 kg
Length	2600 mm
Width	330 mm
Sleeper height	229 mm



SIZE DOES MATTER: HEAVY-HAUL SLEEPERS FOR THE USA

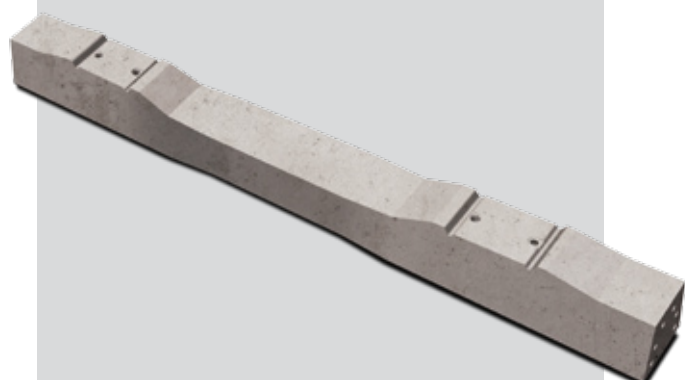
For track in the USA, we need to move up a notch, since lines must be designed for axle loads up to 40 metric tonnes. The reason: fewer wagons carrying the same amount of freight enhance the profitability of a line. On the other hand, heavier loads in the past also entailed greater maintenance expenses and shorter life cycles of the individual track components. RAIL.ONE has developed various pre-stressed concrete sleepers for duty in North America; they stand up better to the characteristics of greater freight-car volumes, and they have longer service lives. It was essential here that the sleepers satisfy the strict stipulations of the American AREMA specifications as well as the regulations of the European standard EN 13230.

During past years, numerous RAIL.ONE test sleepers of various types have been shipped to Brady, Nebraska. This small location between Denver and Chicago is the ideal place for truly rugged track testing. The heaviest-loaded freight line in the world passes through Brady, with annual loads between 225 and 250 million gross tonnes (MGT). And practical testing has confirmed what had been earlier found in extensive testing at Munich University: i.e., that RAIL.ONE has developed concrete sleepers for the American market that pass the rigorous testing with flying colours.



BRAZIL HHS 40/6

PARAMETERS	UNIT
Permissible axle loads	40 t
Maximum speed	100 km/h
Weight (without fastenings)	450 kg
Length	2800 mm
Width	280 mm
Sleeper height	300 mm



THROUGH THE RAIN FOREST: HEAVY-HAUL SLEEPERS FOR BRAZIL

The high cost of building new rail lines often was the reason not to access remote natural resources by rail connections in earlier times. But new conditions in the twenty-first century have fundamentally changed this situation: growing demand has led to price increases for raw materials, and innovations in track constructions make advanced lines more resistant, safer, and more profitable.

RAIL.ONE has developed various heavy-haul sleepers for a Brazilian mining operator that accept heavy axle loads, but also stand up to extreme environment effect. The tropical climate of this equatorial region means high relative humidity and, not least, tremendous amounts of rain during the rainy season – conditions that must be taken into account in planning of the line and design of the sleepers.

BALLASTLESS TRACK: BECAUSE THE DESERT LIVES

With RHEDA 2000[®], RAIL.ONE has developed a ballastless track system that counters the characteristic imponderables of a desert environment, and that minimizes the risk of repairs and failures and the costs for remedy.

After all, even the most reliable ballasted track soon reaches its limits in the desert. In order to optimally fulfil its function, a ballasted bed requires interstices between the pieces of ballast. But it is precisely here where wind carries in desert sand – infiltration that can in many cases cause greater stiffness in the track and greater effects of wear and tear. The employment of RHEDA 2000[®] will give rise to the fact that cost-intensive preventive and remedial maintenance work is abdicable. Based on a concrete supporting layer, ballastless track offers very little surface area for the desert to attack. As a solid, closed structure, it allows sand simply to blow over it, without falling into the system.

The use of especially resistant concrete mix designs prevents the so-called sandblasting effect and the resulting erosion of the sleepers. And RHEDA 2000[®] prevents one further problem from arising. Higher rail bases and fastenings reduce air resistance by allowing gusts of sandy wind to pass through the track instead of being trapped there. This means minimization of time and human resources required to clear sand from the lines.

In addition to these special modifications for track installations in the desert, RHEDA 2000[®] of course offers all the advantages for which the patented ballastless track has become famous around the world. RHEDA 2000[®] combines long service life with low maintenance expenses, and guarantees stable track position and maximum safety under the heaviest of loads. The totality of all these characteristics makes RHEDA 2000[®] the success system of the future for employment in desert regions.



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.



