

SLEEPER PLANT AND PRODUCTION TECHNOLOGY





RAIL.ONE – THE WAY TO GO

You go further on fast, safe railway tracks. We develop innovative and concrete sleepers. This involves know-how and experience with all requirements – worldwide. And what are your plans?

YOUR OBJECTIVE IS OUR CHALLENGE

RAIL.ONE has produced prestressed concrete main-track and turnout sleepers for over 50 years now. During this period, RAIL.ONE has gained comprehensive know-how and international experience in plant construction – with great importance attached to close collaboration with customers and business partners. RAIL.ONE goes for the optimum solution in each new project: top cost efficiency, strict observance of specifications, and engineering design precisely matched to conditions encountered in each country and each specific location. Our particular mode of collaboration accordingly matches each customer's special requirements – whether it be pure machine delivery, combinations with consulting or licensing agreements, or formation of a joint venture for mutual plant operation.

RAIL.ONE – YOUR ONE-STOP PROVIDER

RAIL.ONE GmbH conducts business with the goal of providing comprehensively oriented systems and engineering for the entire field of railway tracks and their many and varied requirements. In this area, RAIL.ONE GmbH – in close collaboration with its customers and partners – carries out as one-stop supplier all activities involved in product development, manufacture, and application of concrete sleepers: beginning with engineering; including production, supply, and logistics; and extending to quality management.

SLEEPER PLANT CONSTRUCTION – FLEXIBLE, FAST AND EFFECTIVE

With its extensive sales and distribution network, as well as locations in Europe, Americas and Asia, RAIL.ONE holds a leading position in track technology and in the production of concrete sleepers. A major international project frequently necessitates the rapid construction of a new plant: for instance, in just four months a plant for producing B70 sleepers was delivered to and set up in Greece. Simultaneously the new personnel were trained with the technical know-how and the basic requirements for manufacturing according to German and Greek standards. Furthermore, by introducing all the necessary testing and measuring procedures, the foundation for correct and effective quality management was also laid. In addition, RAIL.ONE has erected several plants for the production of main-track and turnout sleepers in Germany, China, Iran, Romania, Saudi Arabia, South Africa, Spain, and Turkey. Further projects are under preparation.



SLEEPER UPON SLEEPER UPON SLEEPER

The future of railway infrastructure starts with top quality concrete sleepers. It's a long way from initial planning, through production, and on to smooth delivery. We know the shortcuts: follow us!

SOLUTIONS MADE TO MEASURE

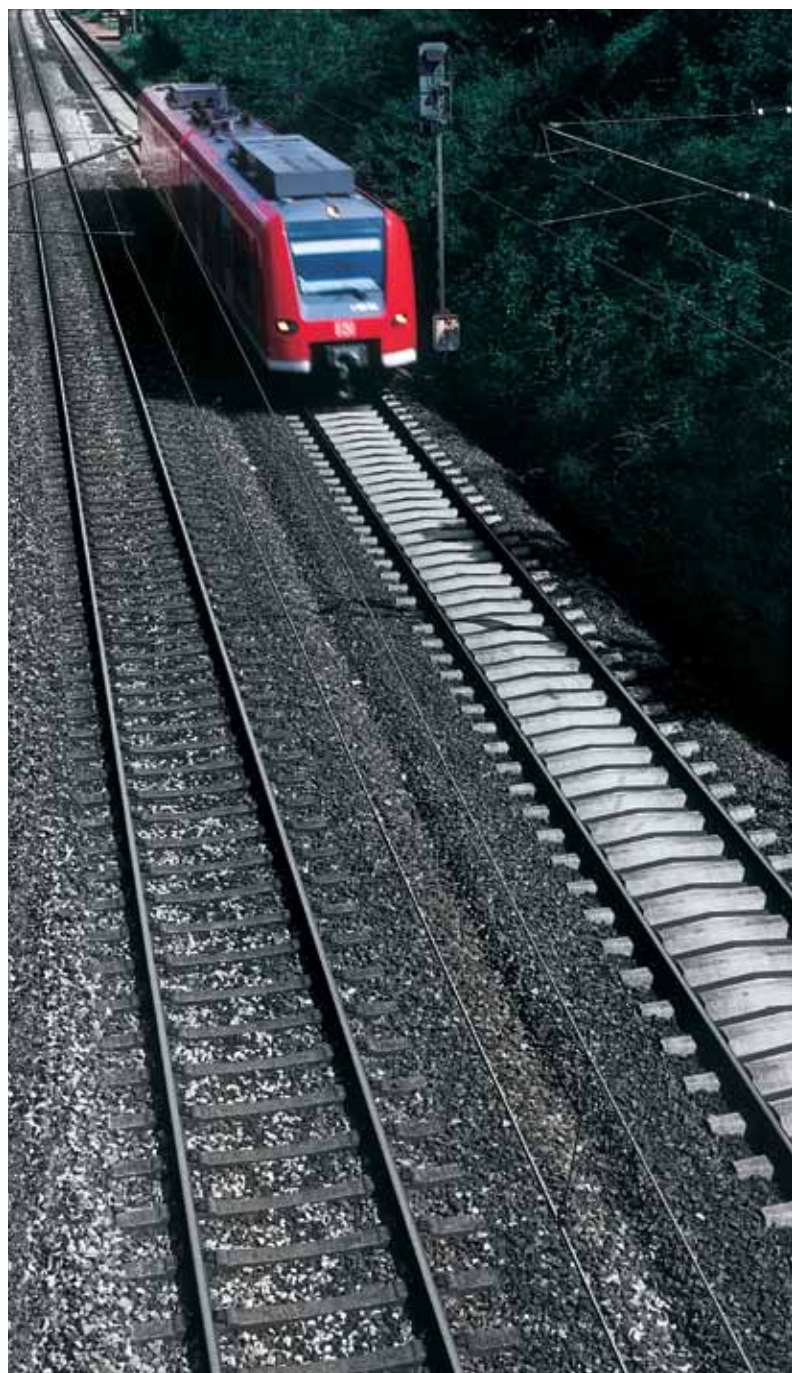
A modern, expanding railway network requires a reliable, cost-effective supply of concrete sleepers. However, their manufacture involves far more than mere concrete. In order to be able to work efficiently, the plant must be optimally designed to harmonise with the local infrastructure and to meet the standards of the respective country. Numerous partners, suppliers, and official authorities have to be taken into consideration and integrated into the decision process. RAIL.ONE has over 50 years' experience in the manufacture of concrete sleepers – in Germany and around the world. The recipe for success: each new plant benefits from our experience. Nevertheless, an individual solution is found for each new project because each project and each location has its specific requirements and its own character.

STEP BY STEP TO SUCCESS

RAIL.ONE supports its customers and business partners from the very start. After clarification of operational requirements, such as maximum speed and axle loads, and following the decision for ballasted or ballastless solutions, the first step is development of optimal sleeper design. The next procedure is examination of the existing infrastructure and the conditions of the future production plant. A draft design is then prepared for the new plant location and the machinery to be installed, on the basis of required production capacity. After analysis of production conditions, humidity, ambient temperatures, and concrete raw materials, production of prototype sleepers begins, with subsequent testing under local conditions. Approval procedures then follow, in accordance with the pertinent standards: e.g., British, US, Australian, or German. By the time of completion of sleeper-plant construction, the sleepers are usually already certified – which means that productivity and profitability can be reliably calculated at an early point in time.

THE COMPLETE PACKAGE

As partner and expert in all business areas and functions, RAIL.ONE considers itself to be the coordinator between the customer, the railway company, and government institutions. RAIL.ONE guarantees one-stop supply and support throughout all areas of performance and work: beginning with planning and consulting, including delivery and installation, and extending to operational support. If desired, RAIL.ONE also trains customer staff in their sleeper plants. RAIL.ONE has worldwide access to an extensive pool of experts and partner companies. The customer receives a complete package to suit his concept: customised, profitable, and ready to operate.





WELCOME ON BOARD

You want to produce concrete sleepers? Then perhaps we can get together. To discuss the possibilities of collaboration. There's no doubt: together we can find a way to benefit us both.

THE RIGHT FORM OF COLLABORATION

RAIL.ONE offers a variety of cooperation models. In any case, our objective is to find the optimal solution for all partners. A joint venture is the closest possible form of cooperation. Another alternative is selling equipment through a licensing agreement: in such cases, RAIL.ONE sells plants and supervises production and quality management on an ongoing basis. The classic consultancy solution means that RAIL.ONE supplies technical and financial consulting, from the planning stage right through to commissioning of the plant. It is also possible to combine consultancy with a licensing agreement. Irrespective of the form of cooperation selected, the moulds required for manufacture of concrete sleepers can be used under a leasing contract.

THE RIGHT TECHNIQUE

RAIL.ONE is the only manufacturer of sleeper plants to offer four specific standardised production techniques, each of which can be modified in compliance with specific requirements. In selecting a particular technique, decisive factors include specific local conditions, cost-effectiveness factors, product engineering characteristics, and process technology. In principle, a high degree of automation in a high-tech plant of course allows maximum productivity, maximum quantities, and greatest flexibility. In addition, care is taken to keep personnel costs to a minimum. On the other hand, these factors are less important in low-wage countries, which mean that primarily manual modes of operation may be preferable: this reduces investments and creates jobs. Crucial for production techniques are also the quality of the local concrete, the desired flexibility, and the quantities. If various sleepers are to be produced in fluctuating quantities and for fluctuating markets, it may, for example, be advisable to apply a flexible carousel rather than a long-line system.

THE RIGHT QUALITY

Owing to the many years of intensive collaboration with Deutsche Bahn AG, high standards are our yardstick. For RAIL.ONE, certification in compliance with DIN EN ISO 9001 is the consistent expression of this quality awareness. All operating processes – beginning with planning and engineering, including production, and extending to logistics and delivery – are constantly subject to inspection and are documented. Safety and quality indeed pay off: measured data support enhancement in operating procedures, which in turn results in overall increases in profitability. Moreover, intelligent quality management is the best basis for obtaining licenses and certification. It is not without reason that RAIL.ONE is the Q1 supplier to Deutsche Bahn AG.

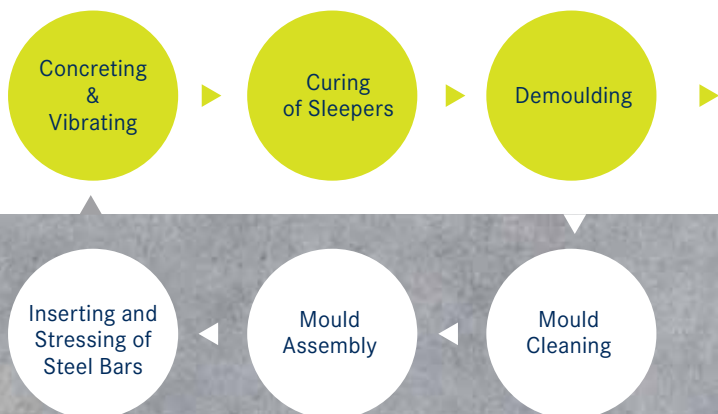


CAROUSEL SYSTEM (DIRECT BONDING)

This high-tech method with a high degree of automation produces approximately 700 to 800 or 350 to 400 sleepers per shift when a manually driven method is chosen. They are manufactured using quadruple or twin moulds continuously guided by a carousel. The sleepers remain in the mould until they are reached the necessary concrete strength. Only then is the pre-stressing force transferred from the mould to each individual sleeper. The precision of the mould guarantees that the required tolerances are observed exactly. It is possible to integrate different sleeper moulds fast and flexibly. Depending on the degree of automation and the number of moulds, it is easily possible to operate multiple shifts with different types of sleepers.

- Great flexibility
- Large variety of types
- High productivity
- Individual automatization concepts

MANUFACTURING



RECIRCULATION OF MOULDS

Process duration approx. 16 h. Use of >> 100 moulds.

ASSEMBLY & DELIVERY



USING HANDS, HEART, AND BRAINS

To achieve something, you have to go hands-on. Manual and semi-automatic production processes offer clear advantages - especially when the utmost of care is necessary. After all: our trade is based on know-how and experience.

LONG-LINE SYSTEM WITH LATE DEMOULDING (DIRECT BONDING)

This classic method of manufacturing main-track sleepers is as simple as it is reliable: approximately 300 to 500 sleepers are produced per day and line. Normally only a maximum of two to three lines are set up; this necessitates multi-shift operation. Flexibility is limited: only one type of sleeper is produced on each line. The obvious advantages: running costs are low and investment costs for the remaining mechanical equipment are also modest. It is easily possible to produce customized sleeper designs and the pre-stressed reinforcement arrangements required. Even under difficult production conditions, top quality is assured.

- Easy to operate
- Low costs
- Best results



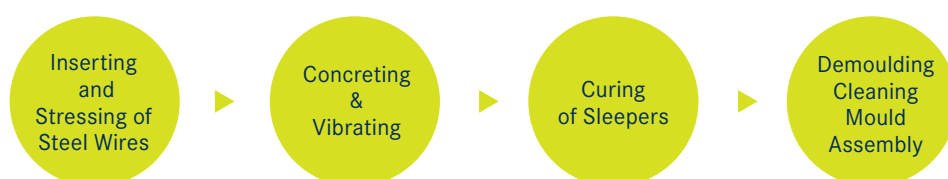
THE MANUFACTURE OF TURNOUT SLEEPERS

Turnout sleepers are manufactured according to the principle of late demoulding with immediate bonding. For this purpose, special double prestressing beds, 80 to 100 metres in length, are used. The moulds are normally filled once a day, since the concrete must harden sufficiently to allow for the extreme prestressing forces. The arrangement of the pre-stressing steel tendons can be adjusted to meet the respective individual requirements. Depending on the number of lines, one to three-shift operation is necessary. RAIL.ONE has special know-how and many years' experience in this complex and highly individualised process.

- Customised production
- Optimum compatibility with rail fastening elements
- Top quality



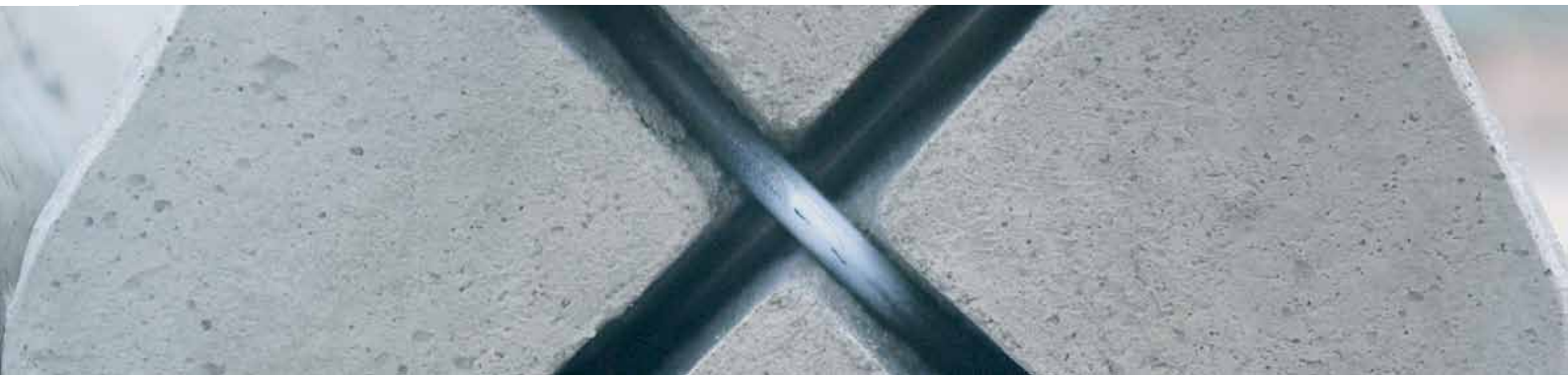
MANUFACTURING



ASSEMBLY & DELIVERY



Process duration approx. 16 h to 24 h.
Use of Long Line System according to capacity demand.

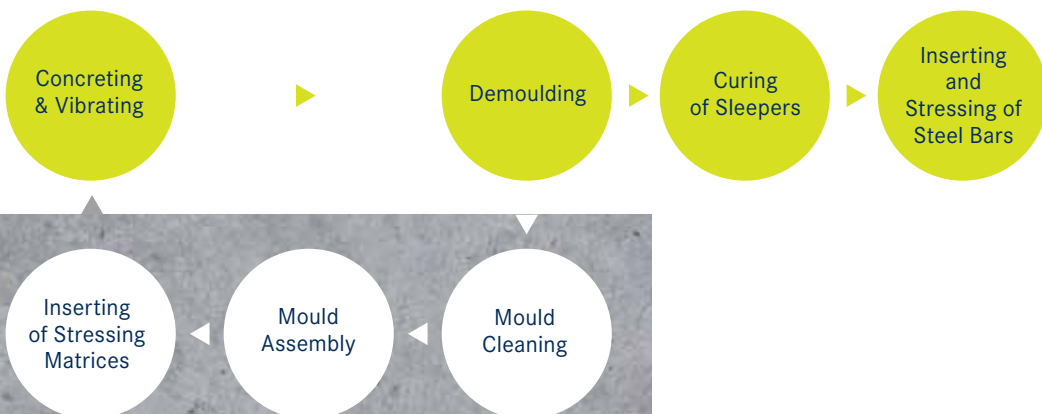


IMMEDIATE DEMOULDING WITH POST-TENSIONING

This method functions with a low number of twin or triplet moulds. Its special feature: demoulded sleepers harden in thermal chambers. If there is sufficient space capacity, production can continue without restriction – there is no difficulty even with multi-shift operations in producing approximately 400 sleepers per shift. The demoulded sleepers are post-tensioned when the concrete has attained the necessary strength. The special advantage: even with the flexible production of different types of sleepers, investments remain low. Fast integration of the new moulds in the processing cycle facilitates a large variety of types. The prerequisites for operating according to this method are a special expertise in concrete technology and maximum care during processing.

- Great flexibility
- Large variety of types
- Low investments and low additional costs

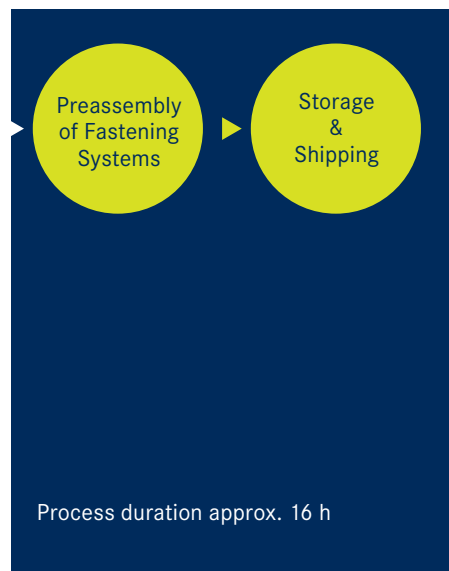
MANUFACTURING



RECIRCULATION OF MOULDS

Recirculating process duration approx. 3 min. Use of 3-4 moulds.

ASSEMBLY & DELIVERY



Process duration approx. 16 h

AUTOMATICALLY MORE PRODUCTIVITY

The strengths of RAIL.ONE are based on its products and on its production processes. We are the only manufacturer to offer four different production processes. With our high degree of automation, we are well prepared for all challenges.

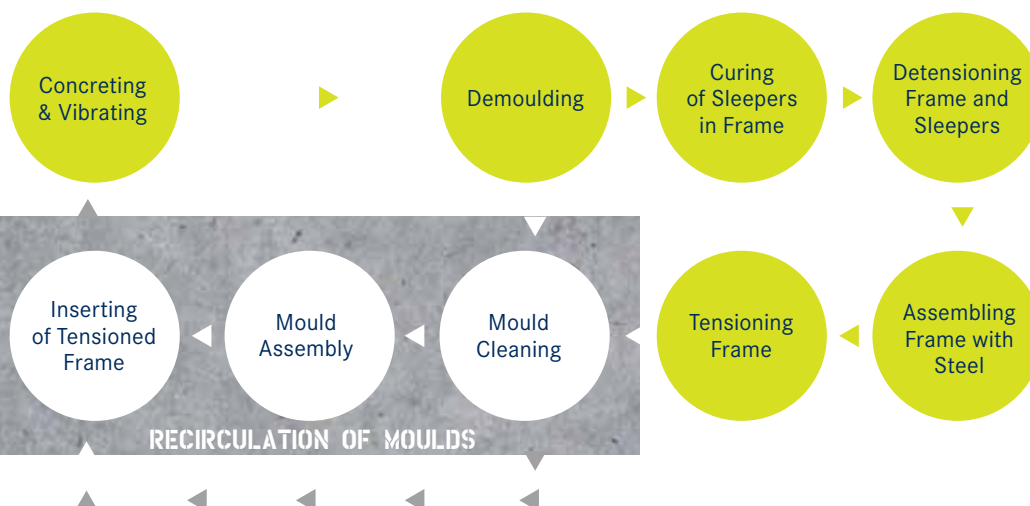


CAROUSEL SYSTEM WITH IMMEDIATE DEMOULDING (DIRECT BONDING)

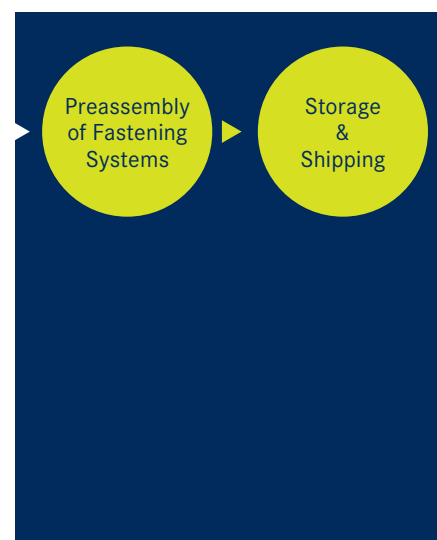
This method consists of a combination of immediate demoulding, and the carousel system with direct bonding. The special feature: the sleepers are cast in a quadruple mould in a stationary concrete casting station. After filling, the quadruple mould is then immediately demoulded. The sleepers then harden cost-effectively in pre-stressing frames on pallets. The pre-stressing force is not transferred until the concrete has hardened sufficiently. This method requires special know-how to observe all tolerances, despite the immediate demoulding of the moulded concrete body of the sleeper. The advantage: only one mould is required for each type of sleeper – a large amount of sheet metal and frames is less expensive than the equivalent number of high-precision moulds. In this way approximately 400 sleepers are produced per shift using the highest possible degree of automation. There are also no problems with multi-shift production.

- High degree of automation
- Low personnel requirements
- Reduced costs

MANUFACTURING



ASSEMBLY & DELIVERY





GLOBALY NETWORKED

The know-how and experience of RAIL.ONE are reflected in more than 300 patent applications. Irrespective of where you are planning and building: we find solutions and deliver – as far as the tracks will reach.



WHEREVER AND WHENEVER

Of course, you don't have to build a sleeper plant to obtain concrete sleepers: RAIL.ONE plans, produces, and delivers on time – to suit your requirements. RAIL.ONE offers production capacities for a total of 3.3 million main-track sleepers and around 680,000 linear metres of turnout sleepers. The various manufacturing methods facilitate the inexpensive, fast, and flexible production of standard products in large quantities, as well as special versions in small series requiring only a short period for preparation. And always to top technical standards.

NEUMARKT/GERMANY Immediate demoulding with subsequent post-tensioning – flexible and inexpensive manufacture of special products

COSWIG AND LANGEN/GERMANY Late demoulding in the carousel system with direct bonding – fast capacity adjustments according to regional aspects – the production of turnout sleepers by means of the long-line method – a high degree of automation – large quantities – optimum productivity

KIRCHMOESER/GERMANY Production of concrete turnout sleepers by the long-line method

LÁBATLANI VASBETONIPARI ZRT./HUNGARY Late demoulding with direct bonding in short moulds – production of concrete main-track and turnout sleepers

TRAVECTEC S.R.L./ROMANIA

- Late demoulding with direct bonding in the carousel system
- Late demoulding with direct bonding – production of turnout sleepers in long-line beds

RAIL.ONE SAUDI ARABIA L.L.C./SAUDI ARABIA Late demoulding in the carousel system with direct bonding – fast capacity adjustments according to regional aspects – the production of turnout sleepers by means of the long-line method – a high degree of automation – large quantities – optimum productivity



TRAVIPOS S.A./SPAIN Late demoulding in long-line beds with direct bonding – immediate demoulding with direct bonding – the production of concrete turnout sleepers by means of the long-line method – optimum production mixture – high degree of flexibility

RAIL.ONE TRACK SYSTEMS S.A./SPAIN Late demoulding carousel system for RHEDA 2000® bi-block sleepers (reinforced)

TM TRACK SYSTEMS LTD./SOUTH KOREA Late demoulding carousel system for RHEDA 2000® bi-block sleepers (reinforced)

RAIL.ONE ILGAZ DEMIRYOLU SISTEMLERİ ÜRETİM İTHALAT İHRACAT LIMITED ŞİRKETİ/TURKEY Late demoulding in the carousel system with direct bonding – fast capacity adjustments according to regional aspects – a high degree of automation – large quantities – optimum productivity

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 high-speed area, patented RHEDA 2000® ballastless track technology has already achieved an internationally leading position. RHEDA 2000® has developed into standard technology for mainline routes used for high-speed traffic. 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 equivalent living conditions in residential regions: they also contribute 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 extreme-load railway traffic 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: customers expect engineering innovations 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 the entire 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 4 specific production processes – which, in addition, can be modified according to special requirements. This combination of plant-facilities engineering and production know-how further guarantees the high quality standard required for all customers.



