

# Abetong Concrete Sleepers

## - The Long Line Method Success



# Abetong AB – The complete technology provider for design and production of prestressed concrete sleepers

The Abetong Long Line Method is a universally recognized concept within the international railway industry. Abetong's manufacturing methods for pre-stressed concrete main line and turnout sleepers are now successfully used by precast companies all over the world.

Back in 1960, Abetong developed its long line method to produce concrete main line sleepers. Around the same time the Abetong monolithic main line sleeper design method was introduced. A decade later the company became the first manufacturer to produce concrete turnout sleepers on a large scale. These production methods have proven to be superior in both quality and efficiency. As a result of continuous research and development programmes over the years the Abetong Long Line Method has gained worldwide recognition.

In 1966 the company started to transfer its know-how on a licence basis. So far, a total of 35 sleeper plants, from Australia in the south to the northern part of Europe, have been established using the Abetong Long Line Method. As a result of this experience the company has built up extensive know-how in concrete sleeper technology.

## Safety, quality and efficiency

Over the years Abetong has designed sleepers for railway organizations all over the world. These have ranged from designs for tramways to heavy haul applications and high-speed pas-

senger traffic. The design has been adapted for use with all main railway fastenings and from the narrowest to the broadest of gauges and for many, many more applications. Today the number of sleepers produced with an Abetong design exceeds 60 million.

A modern Abetong production plant is characterized by safety, quality and efficiency. The factories are of various sizes and mechanization levels, all depending on the client's needs and circumstances as well as the existing market situation. Supported by highly motivated engineers we are constantly looking for further improvements.

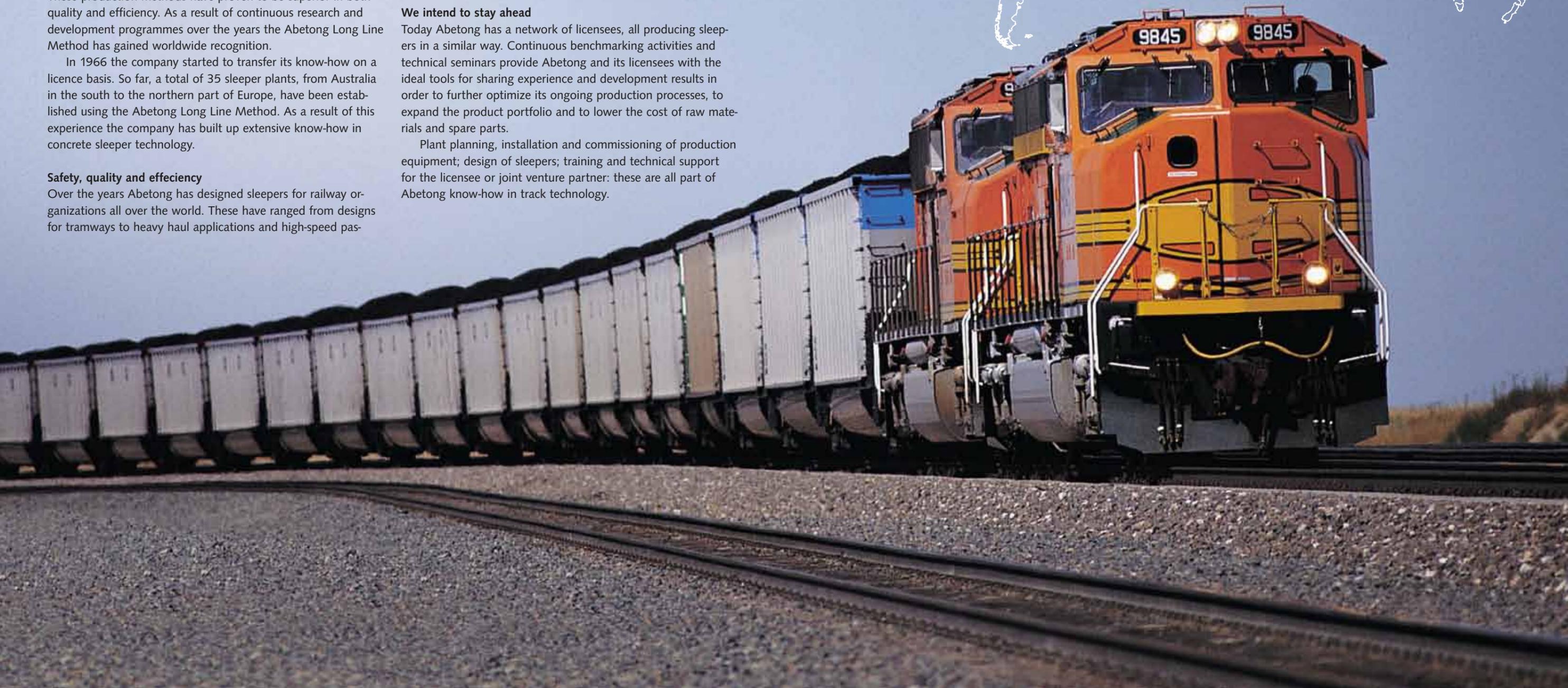
## We intend to stay ahead

Today Abetong has a network of licensees, all producing sleepers in a similar way. Continuous benchmarking activities and technical seminars provide Abetong and its licensees with the ideal tools for sharing experience and development results in order to further optimize its ongoing production processes, to expand the product portfolio and to lower the cost of raw materials and spare parts.

Plant planning, installation and commissioning of production equipment; design of sleepers; training and technical support for the licensee or joint venture partner: these are all part of Abetong know-how in track technology.



*Worldwide. Sleeper plants utilizing the Abetong Long Line Method*

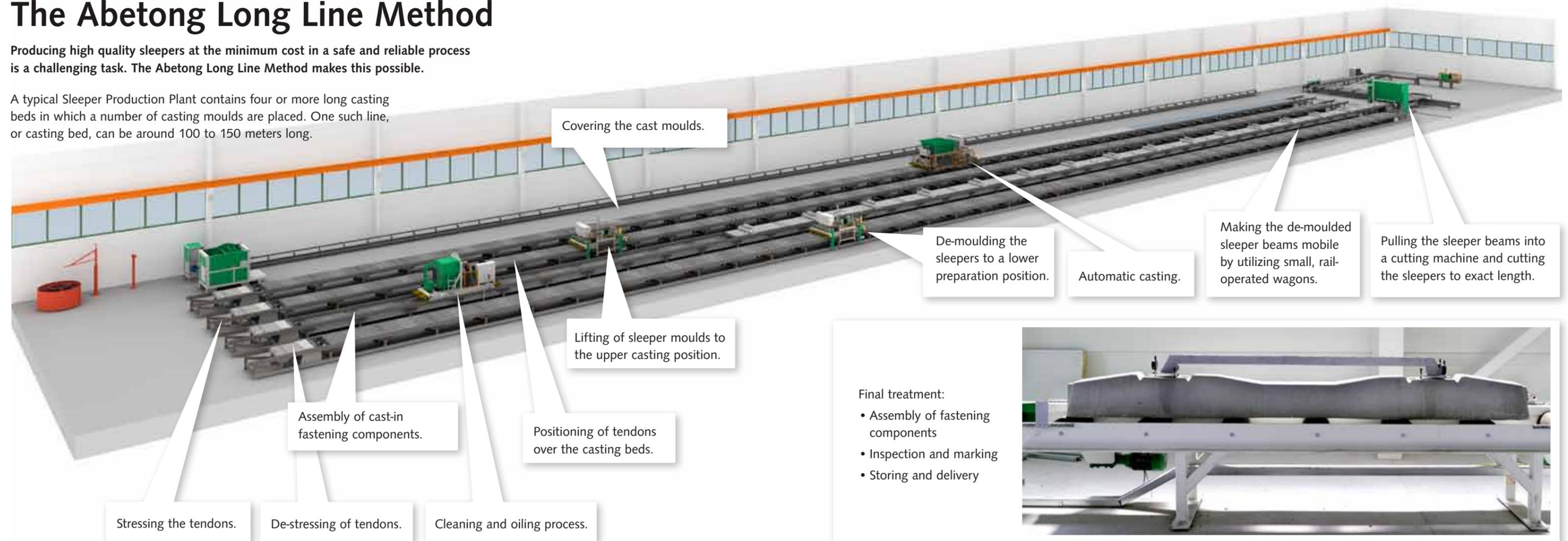


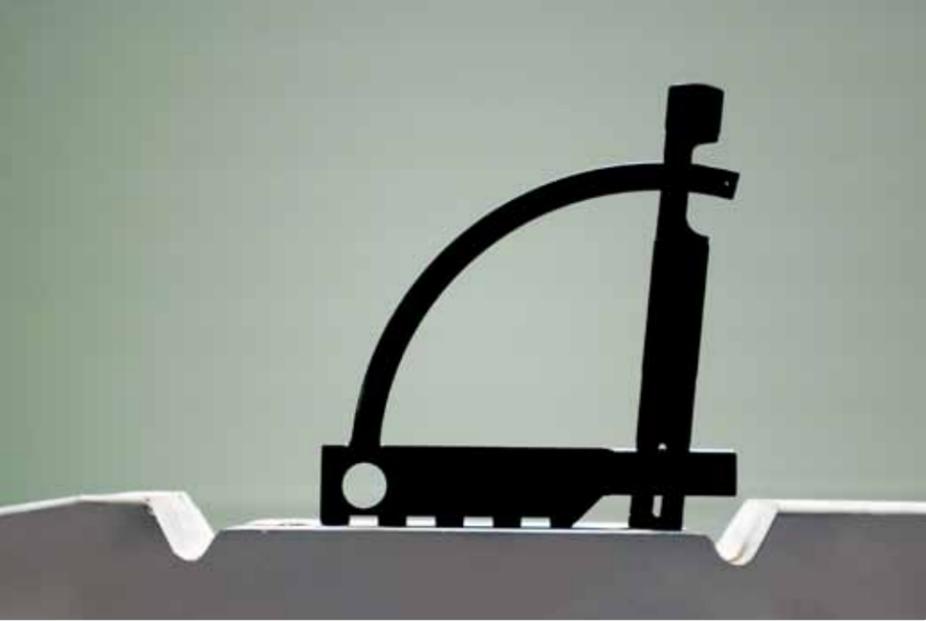


## The Abetong Long Line Method

Producing high quality sleepers at the minimum cost in a safe and reliable process is a challenging task. The Abetong Long Line Method makes this possible.

A typical Sleeper Production Plant contains four or more long casting beds in which a number of casting moulds are placed. One such line, or casting bed, can be around 100 to 150 meters long.





## Research Activities

CHARMEC is an acronym for CHAlmers Railway MEchanics, a globally recognized centre of excellence in railway mechanics. CHARMEC focuses on various research areas with the aim of lowering production, maintenance, operating and environmental costs and improving the overall safety and quality of railway transportation.

CHARMEC's activities are financed by three parties: an industrial interest group with partners representing a great variety of areas in the operation of vehicles and track components, Chalmers University of Technology and Trafikverket, the Swedish Transport Administration.

In 1995 Abetong was instrumental in the establishment of CHARMEC. Ever since, Abetong has been an active partner at CHARMEC, continuously engaged in several PhD projects.

Through its involvement in CHARMEC, Abetong aims to acquire knowledge that will enable the company to put the sleeper in the context of the entire track. With the aid of the research results and knowledge gathered by CHARMEC, Abetong has the necessary tools to execute track analysis beyond the limits of current sleeper standards.

DIFF is a FEM design tool used by Abetong when optimizing sleeper designs, taking into account the entire track structure. DIFF is the Swedish abbreviation for Dynamic Interaction between Train & Track. It was initially developed at CHARMEC and has over the years been further refined by Abetong in relation to sleeper characteristics. As part of its in-depth track analysis Abetong has used DIFF to determine how various design parameters affect the total track structure.



## Sleeper Design

The track record of Abetong in designing sleepers began five decades ago. Ever since then the company has been designing sleepers for clients all over the world, covering all types of conditions, including speed, axle loads, climate and choice of fastening systems.

Hardly any other concrete product involves the same unique design prerequisites as a pre-stressed concrete sleeper. Demanding technical requirements combined with strict geometrical limitations create real challenges for any designer. The vast number of sleepers normally produced also means there is a real incentive to design sleepers with optimized features. Optimization of sleeper designs is a key to success.

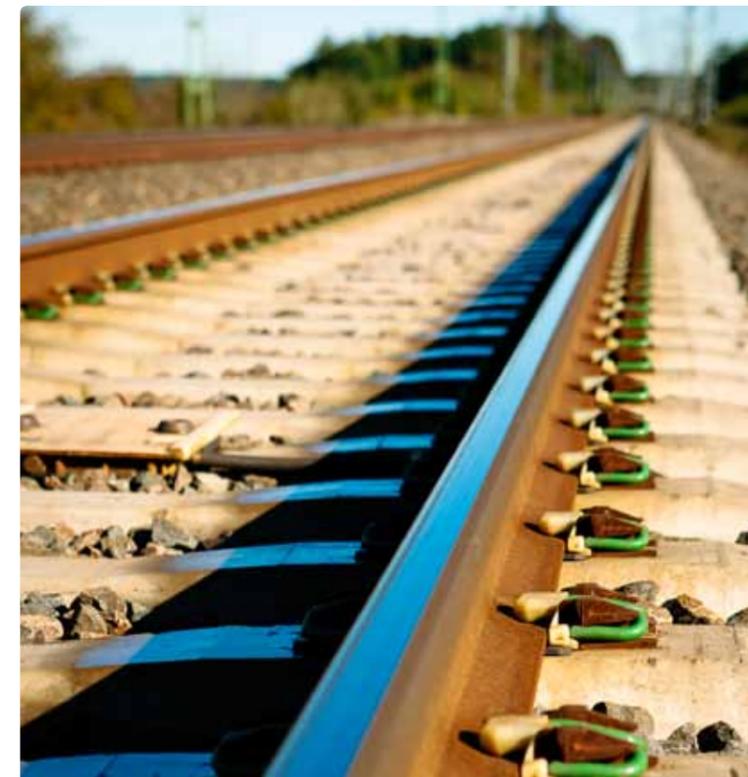
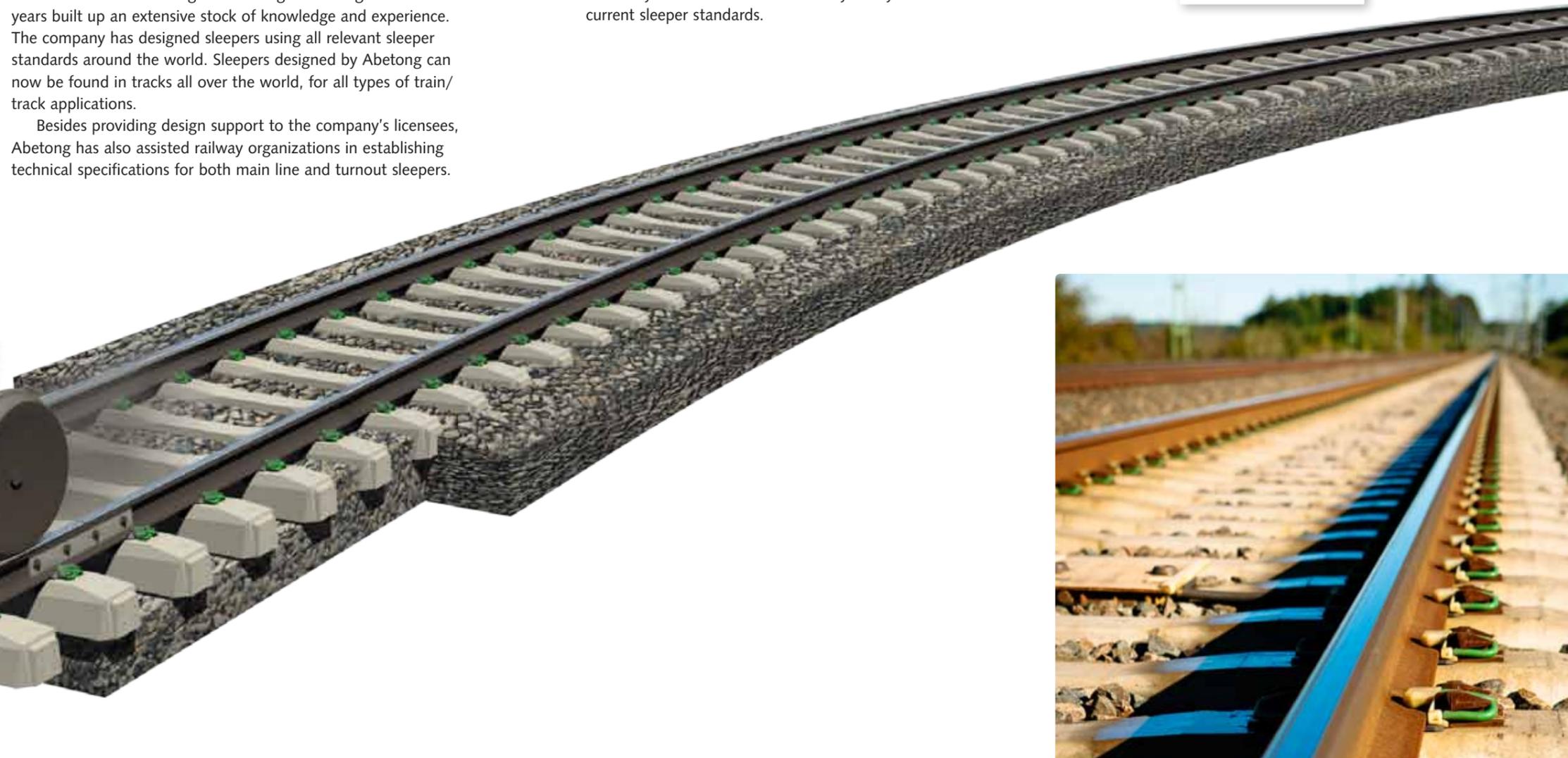
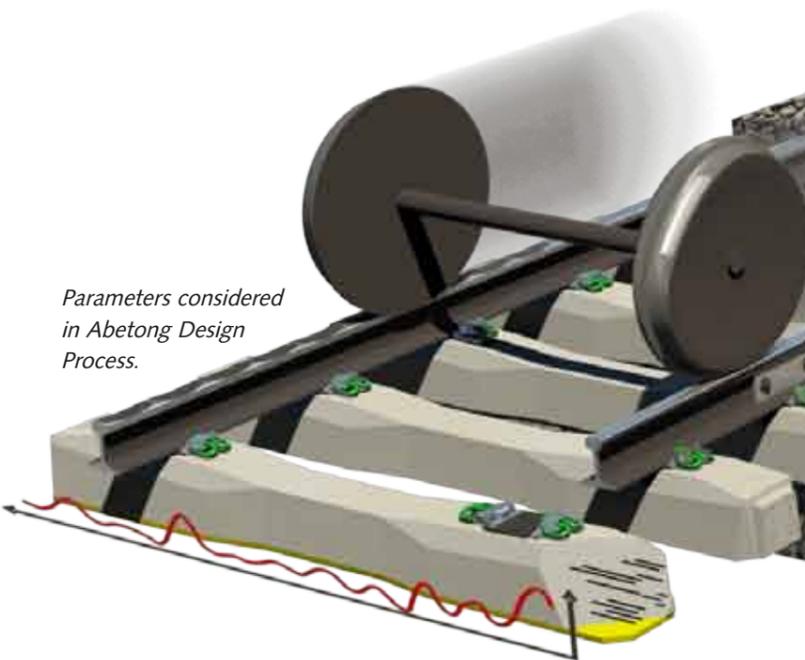
The challenge is not to fulfil a technical specification, but to design a sleeper which gives optimized performance of the entire track structure. Design optimization requires more than just in-depth knowledge of existing sleeper standards. A thorough

understanding of related track components, how these interact and how to determine the true load situation in the track is of vital importance to achieve full optimization.

To meet this wide range of challenges Abetong has over the years built up an extensive stock of knowledge and experience. The company has designed sleepers using all relevant sleeper standards around the world. Sleepers designed by Abetong can now be found in tracks all over the world, for all types of train/track applications.

Besides providing design support to the company's licensees, Abetong has also assisted railway organizations in establishing technical specifications for both main line and turnout sleepers.

Parameters considered in Abetong Design Process.





## Abetong and HeidelbergCement Group

Abetong is a member of Heidelberg-Cement Group, which is the global market leader in aggregates and a prominent player in the fields of cement, concrete and other downstream activities, making it one of the world's largest manufacturers of building material. The company employs some 53,400 people at 2,500 locations in more than 40 countries.



### Passion for concrete.

Based on knowledge and experience, combined with the virtues of concrete, we create added value for our clients. Learn more about us, our products and our passion for what we do at [abetong.com](http://abetong.com).

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