



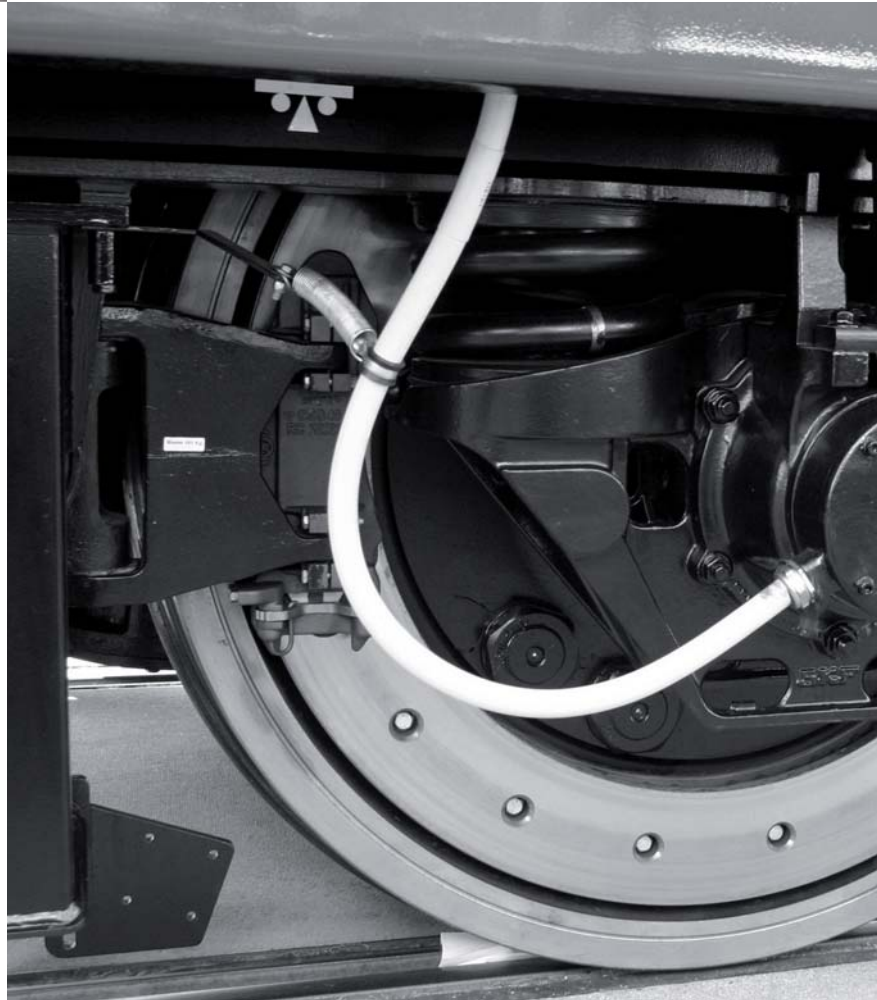
BONATRANS

Bonatrans Wheelsets for Passenger Transport and Locomotives

BONATRANS GROUP a.s. has grown to become one of the leading manufacturers of wheelsets for railway passenger transport and for traction vehicles - locomotives. Bonatrans is a reliable partner of global manufacturers of rolling stock, railways and transport undertakings.

Tailor-made solutions

Bonatrans provides to its clients complete services in development and deliveries of wheelsets and their parts - wheels and axles. Thanks to many years of experience in development of dozens of various designs, and thanks to ongoing improvements of development methods and technologies, the Bonatrans development team is able to offer a new optimal design within a very short lead time.





RIGOROUS MANUFACTURING PROCESS

When developing and manufacturing products for passenger transport and for locomotives, Bonatrans takes into consideration the specific requirements of this type of transport, such as reliability and safety of high speed transport, ride comfort and resistance to damage in operation, and also environmental friendliness - especially in the area of noise reduction.

In order to reduce the unsprung mass of rolling stock, Bonatrans wheels for passenger transportation and for locomotives are designed with minimum possible weight. This has a positive effect on the ride comfort as well as on the infrastructure condition.

New product designs are developed through mathematic modelling of the actual loading of wheels and axles (finite element method, modal analysis, etc). Models used in development by Bonatrans are based on a database of valuable data collected by Bonatrans personnel through empirical research and analyses.

Design properties are verified through tests on samples and on full size specimen (brake tests, fatigue tests, noise tests, etc.). Bonatrans cooperates with a number of renowned research institutes and universities in the fields of research and testing.

In addition to the design team, Bonatrans has also a research department engaged in research and development of new materials, technologies and completely new product types.

Rigorous manufacturing process

High quality and long service life of Bonatrans products for passenger transport and for locomotives begin with quality material of precisely defined properties. Bonatrans achieves such properties through careful selection of reputable steel suppliers and through application of stringent requirements on chemical composition, micro-cleanliness and inner healthiness of the material that are more rigorous than those required by the general standards. Bonatrans achieves high manufacturing precision through use of modern and precision machining centres, capable

of working within very narrow tolerances and achieving high quality of machined surfaces.

Deliveries of wheelsets for passenger transport and locomotives include also assembly of components such as brake discs, bearing systems, antiskid devices, pulse sensors, etc. Bonatrans can also install certain types of drives on power wheelset in accordance with instructions of the drive units' manufacturers.

All products are treated with reliable anticorrosion protection. Bonatrans always defines such surface protection system that will provide optimum protection against corrosion and mechanical damage. When selecting paint systems, Bonatrans also takes into consideration their friendliness towards the environment..

Service life and fatigue resistance

When selecting material and design for wheels and axles, Bonatrans develops and offers solutions that decrease the product life cycle costs and reduce the operational wear and tear and the likelihood of defects. The solutions include optimisation of the design in terms of minimum stress and deformation, improvement of wheel resistance against rolling contact fatigue through application of special steel grades developed by Bonatrans, strengthening of the most stressed axle parts by application of a layer of molybdenum or by roller-burnishing, and a number of other solutions. As a result, Bonatrans products are characterised by long life and reliability.

Power wheelset for regional units

Trailer wheelset with brake discs





BONATRANS SOLUTIONS FOR PASSENGER TRANSPORT AND LOCOMOTIVES

Bonatrans solutions for passenger transport and locomotives

Bonatrans develops and supplies a complete range of products for railway passenger transport and for locomotives.

■ Products for urban transport

In urban transport, rail vehicles move through densely populated areas, and that is why special attention needs to be paid to the issue of noise, which is to a large degree generated in the wheel-rail contact. Bonatrans supplies a number of products for urban transportation, mainly rubber-sprung Bonatrans resilient wheels and power and trailer wheelsets for underground train carriages, mostly with noise absorbers. In the area of suburban transport Bonatrans offers standardised solutions for suburban train units - power and trailer wheelsets.

■ Products for regional and intercity transport

For this type of transport served usually by electric (EMU) as well a diesel (DMU) multiple units with distributed power and typical maximal speed between 160 and 200 kph, Bonatrans offers a number of alternatives of both power and trailer wheelsets. Bonatrans supplies also wheelsets for individual coaches.

■ Products for high speed trains

Wheels and wheelsets for high speed trains (above 200 km/h) are exposed to very high dynamic loading. That is why Bonatrans places a great emphasis on material cleanliness, machining precision, quality control including NDT, but also on design solutions minimizing weight of high speed wheels and wheelsets.

■ Products for locomotives

Modern locomotives are characterized with high power and high operational speeds. This imposes stringent requirements on locomotive wheelsets that carry the

weight of the whole vehicle and transfer traction and brake forces on the railway track. Extensive experience from the development and supplies of dozens of different types of locomotive wheelsets puts Bonatrans among the leading global suppliers for the most powerful types of locomotives (Taurus, Hercules, BR189, PRIMA, DJ4 and many others).

The Siemens Taurus locomotive that broke the world speed record by reaching the speed of 357 km/h in 2007 was fitted with standard production Bonatrans wheels.

References

Bonatrans supplies to leading global manufacturers of passenger rolling stock and locomotives in Europe, Asia and America. BONATRANS GROUP customer base includes companies such as Bombardier Transportation, Alstom Transport, Siemens Transportation, GE Transportation, Rotem, Vossloh, Talgo, Kawasaki Rail Car, Kinki Sharyo, Škoda Transportation, ČKD Vagonka and others.

In addition to original equipment manufacturers, Bonatrans supplies wheels and axles also as spare parts to a number of world major railways and large transportation undertakings. Bonatrans products are used in 70 countries on five continents.

New designs are verified through stringent tests

Axles with longitudinal bore for reduction of weight and for accurate diagnostics

Locomotive wheelset





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