

THE HARDER THE TASK,  
THE HIGHER OUR PERFORMANCE



LOCOMOTIVE



**GHH-BONATRANS**  
Pioneers of wheelset solutions

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## Powerful solutions for locomotives

GHH-BONATRANS designs and manufactures all types of locomotive wheelsets.

In addition to complete locomotive wheelsets, we also supply individual components – wheels, axles and tyres – based on both our design or customer design. Each component is made from high-quality material and produced and assembled with uncompromised precision.

Locomotive wheels and axles are designed for durability and safety, using materials that offer an optimum balance of mechanical properties, such as strength and fatigue resistance. Locomotive wheelsets must withstand high traction forces while maintaining exceptional performance. GHH-BONATRANS design wheelsets meet the most demanding railway industry requirements and are characterized by extended service life and optimized weight. Our solutions are trusted by railway operators worldwide.



## Key references

ALSTOM

中国中车  
CRRC

CZ LOKO  
*Locomotion Excellence*

DB

SIEMENS

SNCF

STADLER

TOSHIBA

Wabtec  
CORPORATION



## Axles with enhanced durability

GHH-BONATRANS supplies a comprehensive range of solid and hollow axles, from standard designs to the advanced **BONAXLE®**, extending the service life, reducing life-cycle costs (LCC), and minimizing the carbon footprint associated with maintenance and operation.

To protect axles and extend their service life, we use these technologies:

- Cold rolling
- **BONACOAT®C1** thick-layer coating system
- Thermally sprayed molybdenum layer on axle seats
- **BONAXLE®** induction hardened axles for maximum strength and service life

## **BONASTAR®** advanced wheel steel grades

The contact area between the wheel and the rail - no larger than a 1-euro coin - must withstand immense forces. It not only bears the locomotive weight and transfers the guiding forces but also transmits the traction power that often exceeds 0.5 MW. In short, locomotive wheels are subjected to extreme loads, and only high-quality steel with precisely balanced mechanical properties can give them extended service life.

Our **BONASTAR®** steel grades provide the solution to this demanding challenge. **BONASTAR®ER8**, **BONASTAR®ER9**, **BONASTAR®4BD** are advanced steel grades derived from the common ER8, ER9, and ERS8 grades (as per EN 13262). Exploiting our extensive expertise, we have significantly enhanced their properties in many aspects. Continuous data collection from wheel operations, combined with precise tread profile failure analysis, contributes to the ongoing development of all our **BONASTAR®** steel grades. The advanced steel grades fully comply with EN 13262.

For long-lasting wheel performance on tracks with rails conforming to DSTU and GOST standards, we supply **BONASTAR®G2** advanced steel grade.

Additionally, **BONASTAR®CLC** advanced steel grade has been developed for high durability and extended service life in heavy haul and desert conditions.

Let us protect our planet. Use long-lasting products.

## GHH-BONATRANS wheelsets set the standard in the locomotive segment

- Durable wheelsets, wheels and axles with extended service life
- Low life cycle costs and carbon footprint of our products
- Safe solutions for the most demanding service conditions with aggressive substances
- The world's most powerful locomotives run on GHH-BONATRANS wheelsets
- The world locomotive speed record (357 km/h) achieved on GHH-BONATRANS wheelsets

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