

# SAFETY AND LONG SERVICE LIFE



**FREIGHT**

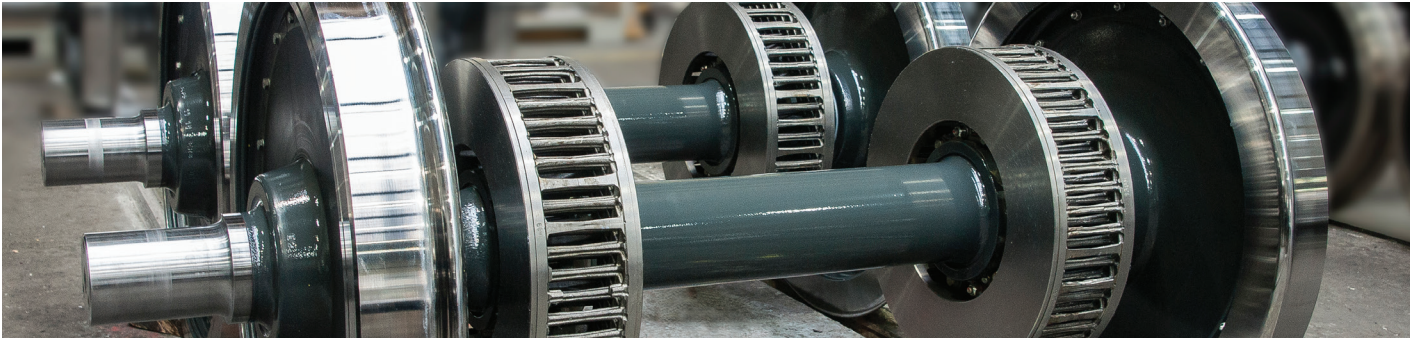


**GHH-BONATRANS**  
Pioneers of wheelset solutions

## Safety and long service life in extreme conditions

GHH-BONATRANS is the largest European producer of wheelsets, wheels and axles, backed by strong expertise in development and design. Many of our wheelset designs have set industry benchmarks, not only in Europe but globally, thanks to their exceptional safety and other benefits. Today, half of modern freight wagons manufactured in Europe run on our wheelsets.

We specialize in wheelsets with extended service life, helping operators reduce operational and maintenance costs while also minimizing environmental impacts. Through careful optimization of wheel and axle design, their assembly, steel grades, noise emissions, protective coatings, and other aspects, GHH-BONATRANS is fully equipped to design, manufacture, test and homologate any type of freight railway wheelset. Our expertise includes wheelsets with stress optimized wheels capable of withstanding high thermal and mechanical loads, ideal for wagons equipped with tread brakes. We also provide wheelsets with high resistance to rolling contact fatigue (RCF) needed for wagons with axle mounted brake discs. Additionally, we offer integrated noise-absorbing solutions to ensure quieter railway operation in densely populated areas.



## Why choose our freight transport solutions?

- **Extended service life & low life cycle costs (LCC)** - enhanced steel grades and advanced technologies reduce costs over the product service life
- **Exceptional safety & reliability** – engineered for optimal performance in demanding conditions
- **Full interchangeability** – seamless replacement of other freight wheelsets
- **Minimized residual stress** – low risk of crack initiation and propagation
- **High thermal & mechanical resistance** – designed to withstand extreme loads with minimal tangential stress and lateral wheel rim displacement

## Key references





## Safe and reliable freight wheels

GHH-BONATRANS offers a wide range of wheel designs tailored for customer needs, verified by tests and certified by all European railways and authorities, the UIC committee and TSI. Most importantly, these wheels have demonstrated their reliability over hundreds of millions of kilometres in safe operation.

BONATRANS has developed four generations of stress optimized railway wheel designs specifically for freight wagons equipped with tread brakes:

- First generation: **BONA314** and **BONA324**
- Second generation: **BONA318** and **BONA319**
- Third generation: **BONA313** and **BONA320**
- Fourth generation: **BONA830EM**

The increasing thermal load due to braking with composite blocks (K, L, and LL), along with stricter noise emission limits, has driven further innovations in GHH-BONATRANS wheel design, steel grades, and wheel-mounted noise dampers. We applied state-of-the-art calculation and testing methods to develop the third generation of lightweight, low-stress, and low-noise freight wagon wheels – **BONA313** and **BONA320** with high-efficiency **BONASILENCE®R+** noise-damping rings. Manufactured from the advanced **BONASTAR®ER7** steel grade, these wheels offer high resistance to wear and rolling contact fatigue, which significantly extends their service life.

## BONACOAT® advanced protective coatings

**BONACOAT®** is a family of high-performance protective coatings with exceptional durability across all axle, wheel, and wheelset surface protection classes.

Compliant with EN 13261 and approved by DB (BN 918300 bl.12, DBS 918301) and ÖBB (Module 9), **BONACOAT®** offers:

- High protection against mechanical axle damage
- Exceptional resistance to corrosion and chemical agents
- Compliance with flammability and toxicity limits
- Service life exceeding common axle maintenance intervals, resulting in a lower carbon footprint compared to other coating systems.

## Low-maintenance wheelset with additional safety margin

The **BONAESFA** axles meet the European Standard Freight Axle (ESFA) requirements.

The **BONAESFA** axle seat and axle body have min. 10 % higher safety margins compared to common freight axle/wheelset design.

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