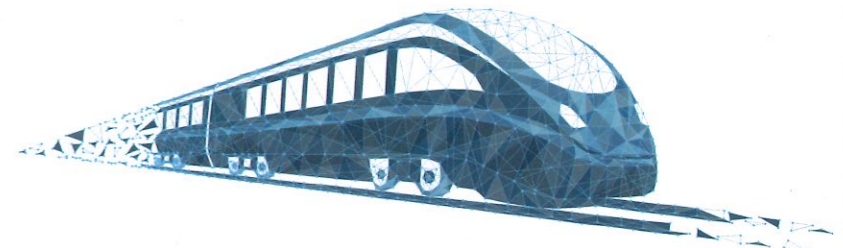


 **BAOWU**

BAOWU GROUP MASTEEL RAIL TRANSIT MATERIALS TECHNOLOGY CO., LTD.



To be a global leading enterprise in the rail transit wheel and axle industry
China wheel and axle, trusted by the world



CONTENTS

- Introduction
- Research and Development
- Technical Equipment
- Products
- Sales Network





BAOWU GROUP MASTEEL RAIL TRANSIT MATERIALS TECHNOLOGY CO., LTD.(shorted as Baowu Trans)

Established in March 2020, it is a first-class subsidiary of China Baowu. Taking China Baowu as the leader of global steel industry, Masteel is committed to becoming the global leading enterprise of rail transit wheel and axle industry, actively practicing the concept of "building a high-quality steel ecosystem" and striving to "let the world trust China wheel and axle".

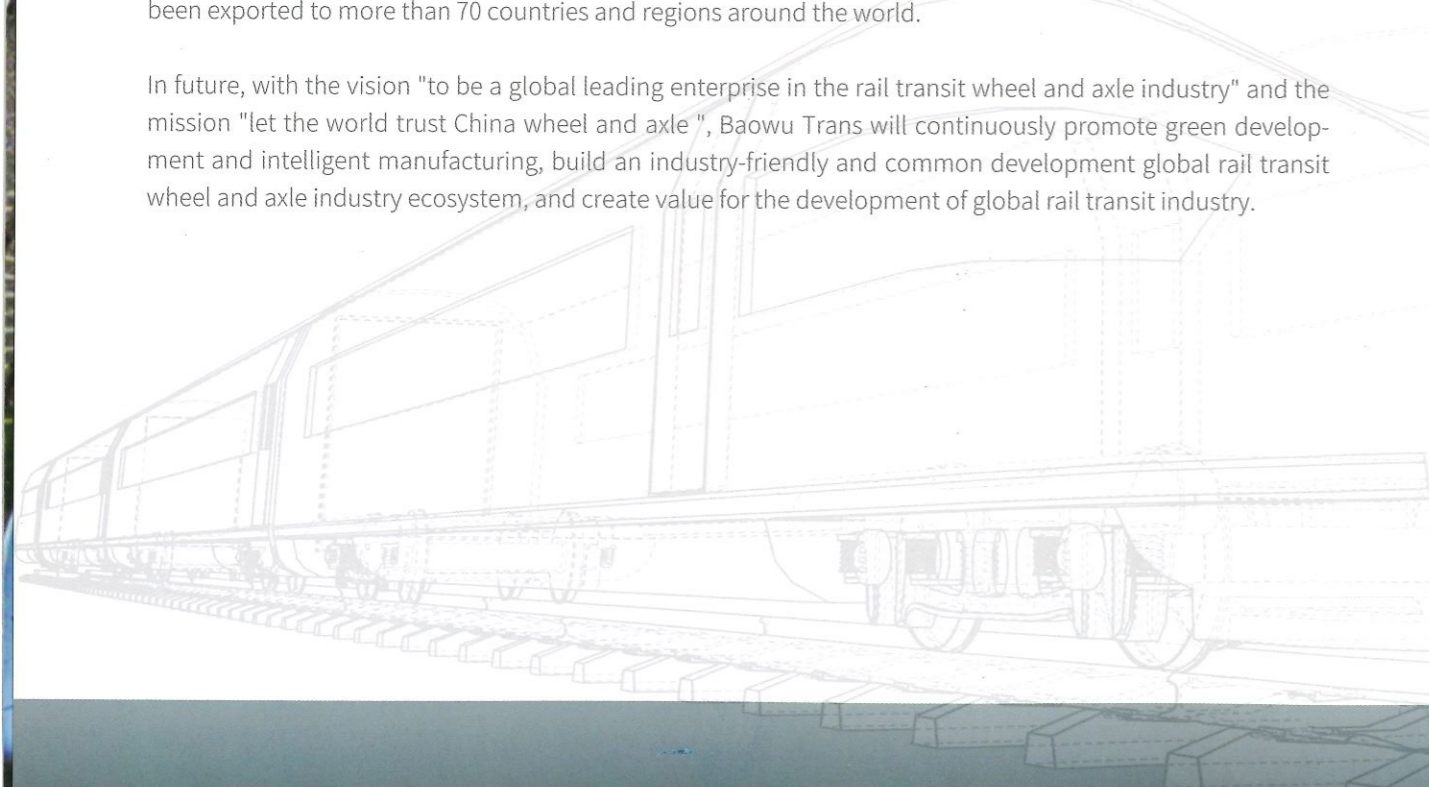
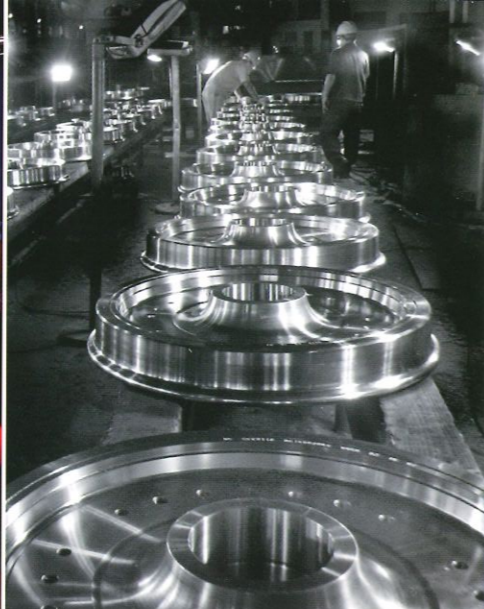
Baowu Trans now has three manufacturing bases, respectively wheel production base, axle and wheelset production base and Masteel Valdunes. Its products include wheels, axles, tyres, rings and wheelsets, with an annual production capacity of 750,000 wheels, 50,000 axles, 250,000 tyres & rings, and 50,000 wheelsets, also with businesses of wheelset maintenance and bogie maintenance. The company has successively passed CRCC certification of China Railway, IRIS certification of International Railway Industry, AAR certification of American Railway Association, DB certification of German Railway, TSI certification of European Union and other systems and product certification. After nearly 60 years of development, the company has owned the internationally advanced manufacturing technology, with the brand advantage of full coverage of global wheel standards. It is the only enterprise with full coverage of wheel product spectrum in China, and its products have been exported to more than 70 countries and regions around the world.

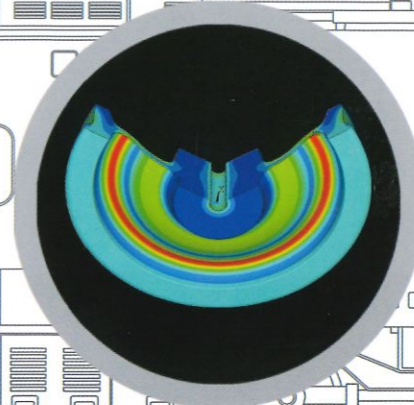
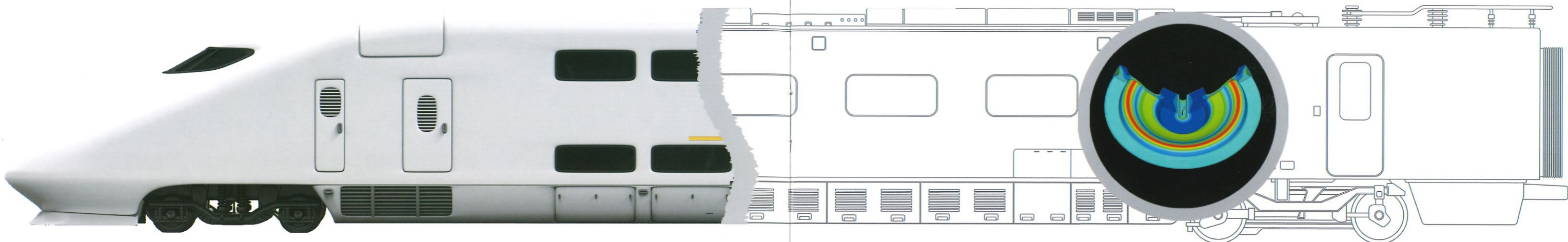
In future, with the vision "to be a global leading enterprise in the rail transit wheel and axle industry" and the mission "let the world trust China wheel and axle", Baowu Trans will continuously promote green development and intelligent manufacturing, build an industry-friendly and common development global rail transit wheel and axle industry ecosystem, and create value for the development of global rail transit industry.

R & D TEAM

The R & D team of Baowu Trans works in two bases, in China and in France. China R & D center is composed of more than 60 core members. The team is committed to the research and development of science and technology frontier products, manufacturing technology, service conditions, technical standards, intelligent services and other aspects of railway and rail transit materials.

The team has a national technology center, five provincial innovation platforms, a large number of research equipment, and has established strategic cooperative relations with many scientific research institutes, such as General Academy of Iron and Steel, Tsinghua University, Shenyang Institute of Chinese Academy of Sciences, and Beijing University of Science and Technology. The team presided over and participated in numbers of national 863, 973 projects and national railway R & D projects. It is the technology leader of wheel and axle in China, mastering the core technology of wheel and axle.

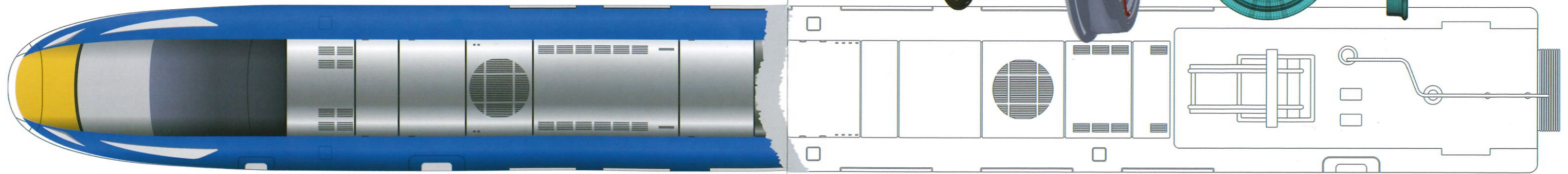
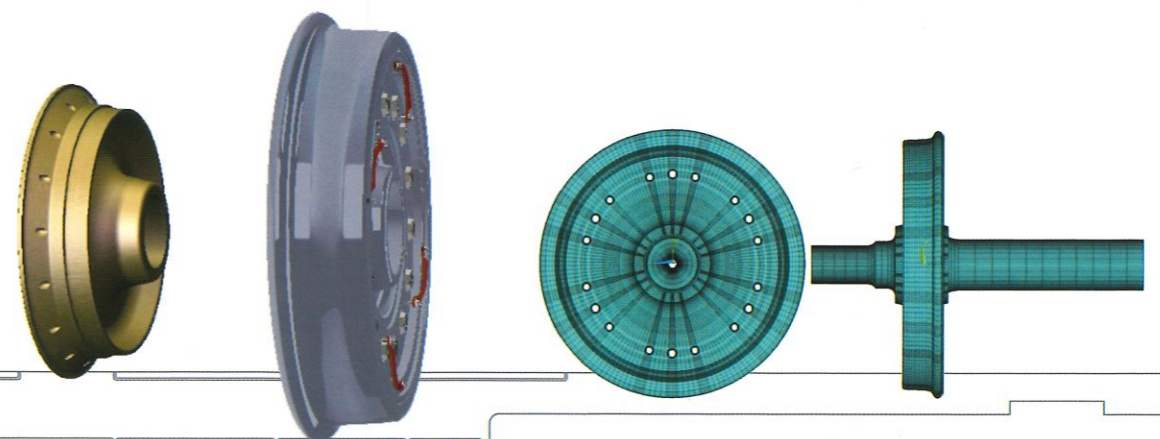
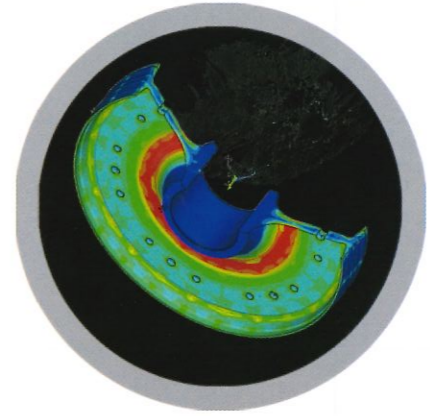
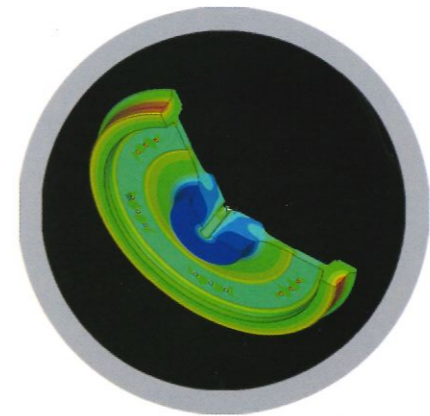




RESEARCH AND DEVELOPMENT

The domestic EMU wheel with the speed of 350 km / h developed by Baowu Trans passed the loading assessment, its quality met the assessment requirements, and the company successfully obtained the first CRCC certificate of high-speed wheel in China. In 2018, China's high-speed wheels were exported to Germany, realizing the first export in batch.

Baowu Trans has developed and produced wheels with ER9, B6T, B4N, AAR-B and other materials, 840mm diameter wheels for subway, 660mm diameter wheels for tram and 730mm diameter resilient wheels, and applied for more than 10 patents. Masteel's resilient wheel has passed the audit of Alstom France, National Railway Administration of Turkey and CSR Zhuzhou. All technical indexes are better than those of imported products.

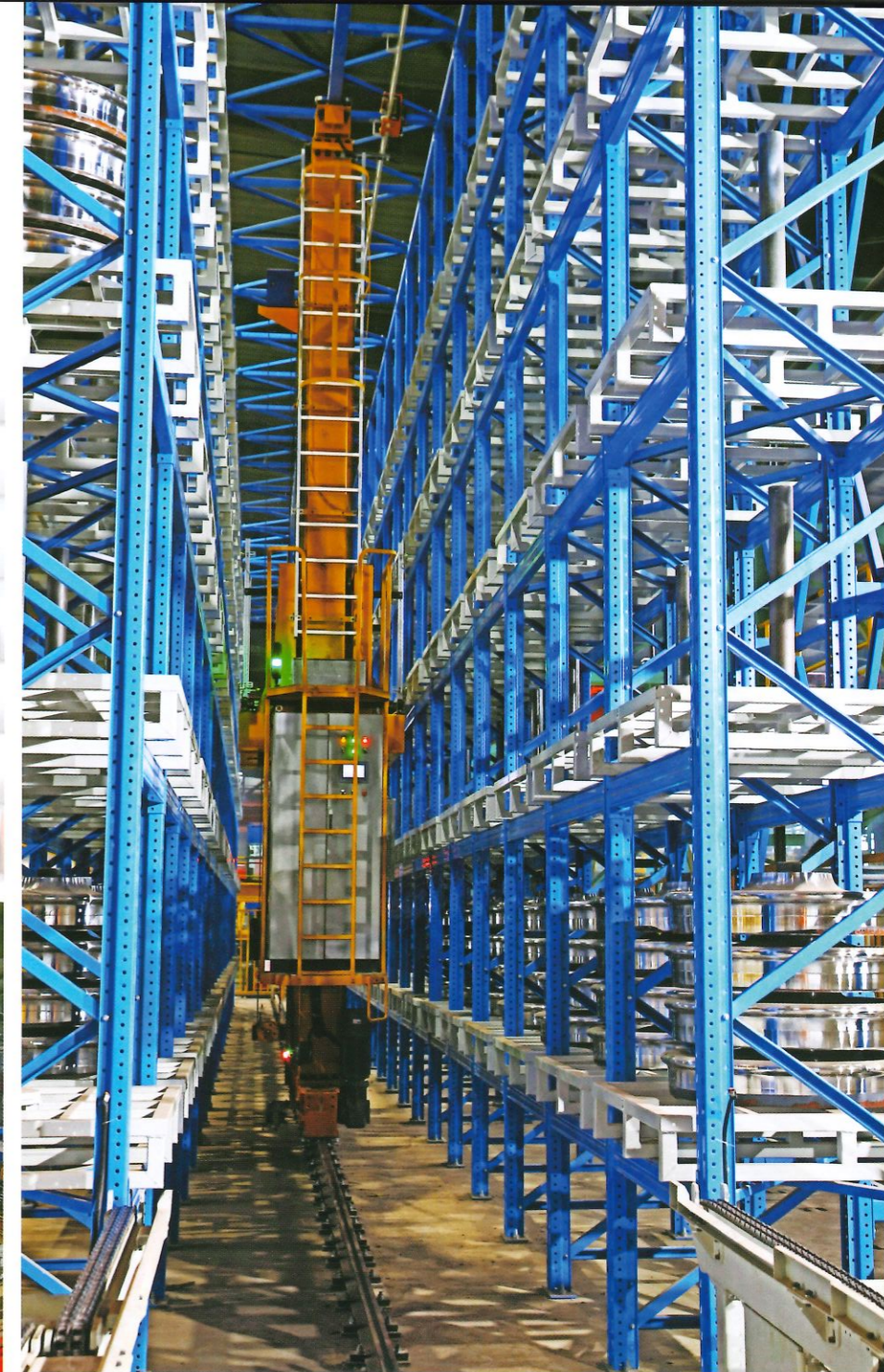


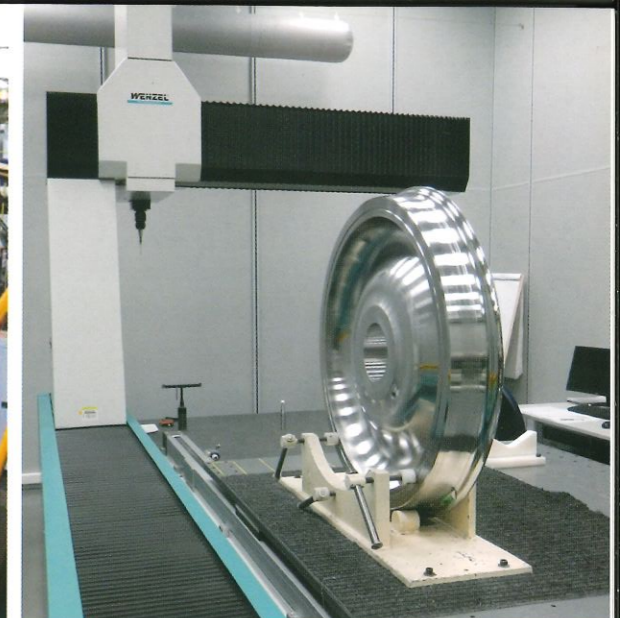
TECHNICAL EQUIPMENT

Wheel Production Base

Second line of wheels Masteel's second line of wheels built in 2003 is the first fully automated wheel production line. The combination of unique process design of Maanshan Iron and Steel Co., Ltd. and the outstanding manufacturing technology of SMS Germany improved the wheel deformation process. The second production line has the flexible production capacity to meet the needs of large or small diameter wheels, in large or small batch. The standard EMU wheel, which represents the level of Chinese manufacturing, was born on this production line.

Third line of wheels The third line of wheels, independently integrated by Masteel Group, was built in 2008 by the company with the assistance of Phima Intelligence Technology Co., Ltd., Baowu Heavy Industry and other units. In 2020, it completed the intelligent transformation and became an intelligent factory in Anhui Province. The production line is highly intelligent, realizing whole-process data integration, less personalized operation, one-key design, one-key rolling, one-key processing and intelligent inspection, and the whole-process digital twin technology lays the foundation for the wheels to achieve whole-life cycle management. The third line is rigid and flexible, and its production efficiency ranks among the global leaders.





TECHNICAL EQUIPMENT

Axle and Wheelset Production Base

Baowu Trans' axle and wheelset production base is located in the National Economic and Technological Development Zone of Maanshan City, Anhui Province. The base includes axle and wheelset maintenance production line and urban rail transit wheelset disassembly and cleaning maintenance line.

Axle Production Line

Baowu Trans' high-speed axle production line produces various axles and semi-finished axles, with an annual output of 70,000 axles. It mainly produces axles for freight cars, urbanrail Metro, EMU and locomotives. The key equipment of the preproduction line are the mainstream equipment with mature application, outstanding performance and excellent control in China, and the thermal control requirement for axle has been improved. Baowu Trans conducted heat treatment in the trial production of the first batch of carbon steel axle on March 17, 2017, and the performance indexes were higher than the standard.

Disassembly and Cleaning Maintenance Line for Urban Rail Transit Wheelset

It has an annual production capacity of 5,000 maintenance wheelsets.

Masteel Valdunes (MGV)

Masteel Valdunes (MGV)

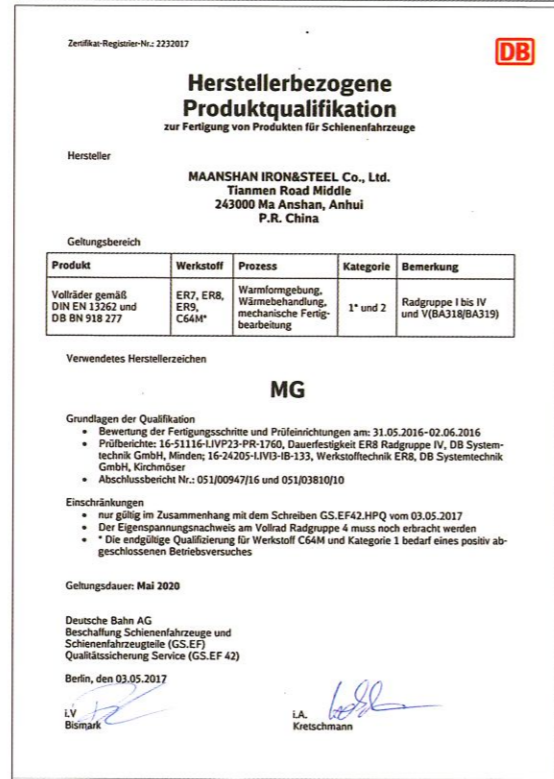
Formerly known as Valdunes France, it is a world-famous high-speed axle production base. It has more than 100 years of history of railway wheel, axle and wheelset production, and has complete design and development, forging, heat treatment, machining and nondestructive testing capabilities. The base has successively passed the certification of international mainstream system and standards, and provided wheels, axles and wheelsets for major European vehicle manufacturers and important railway operators. The high-speed train produced by Masteel Valdunes has set the highest record of 574.8km/h in the world and maintained the record up to now.



SALES NETWORK

The ultimate professional wheel, axle and wheelset products
 Extended rail transit professional services

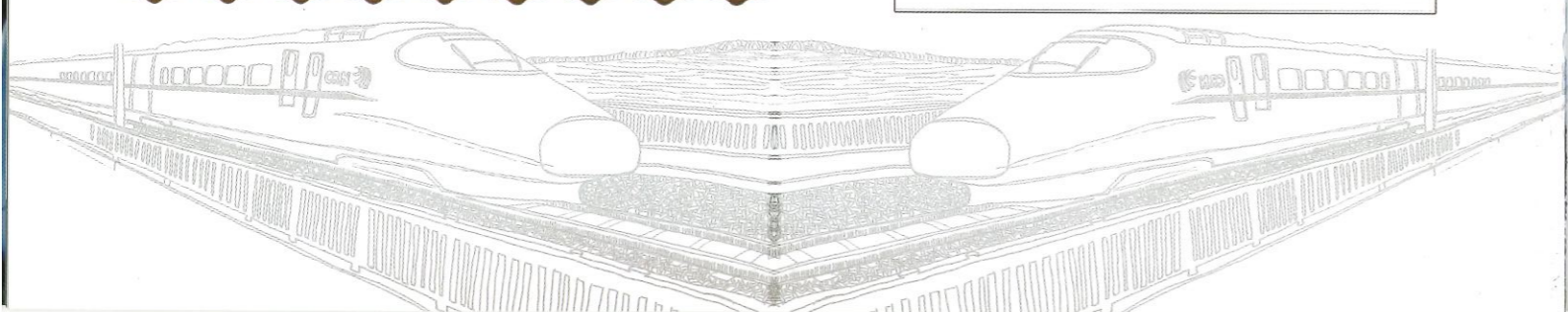




China wheel and axle, trusted by the world.

Creating value for customers with intelligent service.

To be a global leading enterprise in the rail transit wheel and axle industry.





BAOWU GROUP MASTEEL RAIL TRANSIT MATERIALS TECHNOLOGY CO., LTD.

Add: No.700, East Yinhuang Street, Economic and Technological Development Zone, Maanshan

Tel: +86 0555 2883669

Fax : +86 0555 2888282



HEAVY-LOAD WHEEL

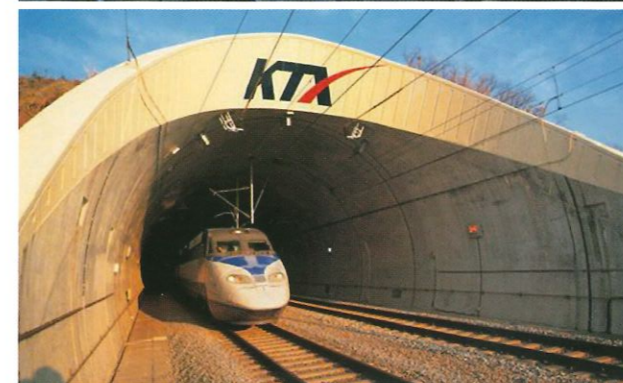
In the field of research and development of heavy-load wheels, Baowu Trans has presided over the national 863 projects for many times. Through continuous breakthroughs in technology, Baowu Trans has successfully developed heavy-load wheels suitable for various working conditions and axle loads in various countries, and formed a complete set of production and manufacturing technology integration. At present, Baowu Trans has formed a full coverage of 30 ~ 45 tons of axle load products, of which 45 tons of axle load wheels independently developed and manufactured are the largest heavy-load wheels in the world, realizing mass production and supply for the first time in the world.



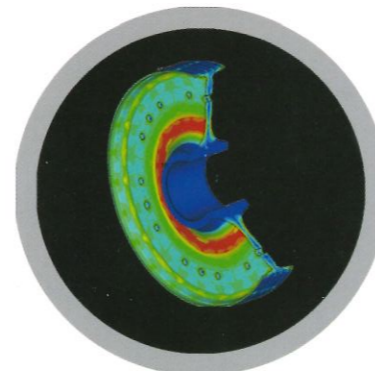


HIGH SPEED WHEEL

As the earliest railway wheel manufacturing base in China and the largest in the world, Masteel has accumulated, broken through and innovated continuously through long-term R & D of high-speed wheel technology and investment in technology and equipment. With the support of the State and Anhui Province, Masteel has established a multi-disciplinary R & D team, which has cooperated with China Academy of Railway Sciences, General Academy of Iron and Steel, Tsinghua University, Southwest Jiaotong University, Beijing Jiaotong University, Shanghai Jiaotong University, Beijing University of Science and Technology and other domestic well-known institutions, has undertaken and participated in the National 863 and 973 projects, major provincial and ministerial projects, and closely followed the needs of China's railway development, systematically carried out research, continuous improvement and technical transformation from the preparation stage, initial stage and upgrading stage of China's high-speed railway development, high speed wheel manufacturing system, inspection system and quality assurance system have been established.



On the domestic high-speed wheels, Masteel has obtained the first CRCC certificate of China Railway, and has the qualification of wheel production and sales for Fuxing EMU. Masteel has independently developed D2 wheels for 350 km / h and assembled them on five Chinese standard EMUs. Through 600,000 km loading operation, the wheels assembled on the "Blue Dolphin" and "Golden Phoenix" Chinese standard EMUs have withstood the first 420 km / h rendezvous test in the history of world high-speed railway, and its service effect is better than that of imported ER8 wheels assembled on the same vehicle. So far, it has operated more than 1.3 million kilometers safely.





RESILIENT WHEEL

Low Floor

Masteel Valdunes has more than 20 years of experience in design, manufacture and maintenance of resilient wheels for low floor trams, and has structural patents for VUT, NEO, VLR and 1,060, with a diameter of 400mm-880mm. Since 1998, Masteel Valdunes has delivered more than 20,000 VUT series resilient wheels to ALSTOM, Bombardier and other main engine plants, operating in Europe, North Africa, North America and the Middle East. Baowu Trans has more than 10 years of experience in manufacturing low floor resilient wheel components, and more than 10,000 sets of resilient wheel components have been produced for export till now.

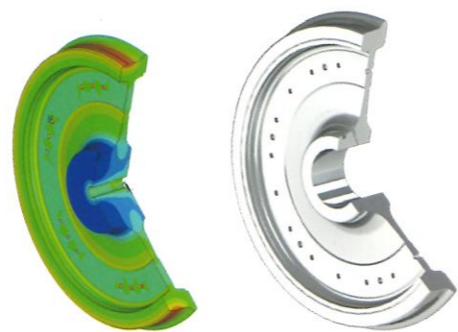
Metro

Baowu Trans provided 730mm resilient wheels for CRRC Sifang Co., Ltd. in 2019, axle load 15.5 tons (including electromagnetic suction). Through 10 million times of fatigue tests, the product ensured the structural safety. Baowu Trans cooperated with Masteel Valdunes to develop 580mm resilient wheel in 2020, used on the new metro inspection vehicles. On August 19, 2020, the 580mm resilient wheel just off line was inspected by the Party and the State leaders.





HIGH-POWER LOCOMOTIVE WHEEL



China's railway locomotives have experienced a great development from Dongfeng and Shaoshan series locomotives to high-power AC drive locomotives, and China's locomotives have provided a strong guarantee for national economic development. The highest operating speed of high-power AC drive locomotive is up to 100km/h, and the technical requirements of locomotive wheels are high but the production is difficult. Compared with foreign locomotive wheels, Masteel has reached international advanced level in material design, metallurgical quality, comprehensive performance, testing technology and intelligent manufacturing, and Masteel is also the first enterprise to obtain the qualification of AC drive locomotive wheel production in China. Masteel's high-power locomotive wheel won the first prize of National Metallurgical Science and Technology Award in 2015 and was nominated for the second prize of National Science and Technology Progress Award in 2019.



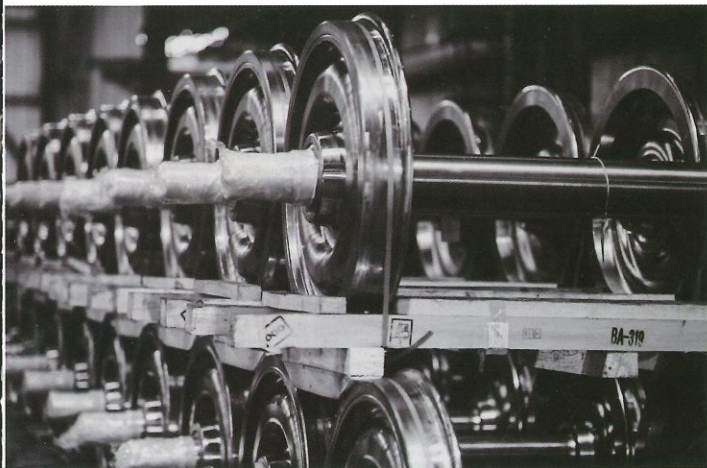
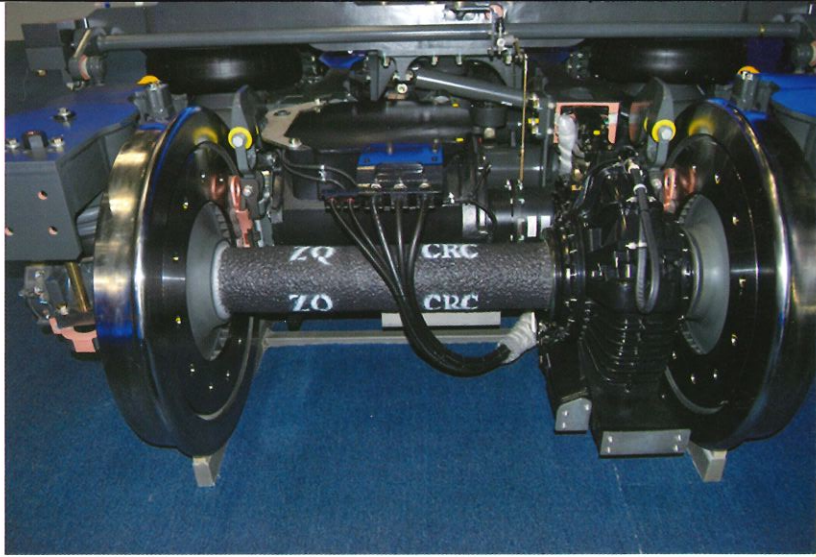
WHEELSETS

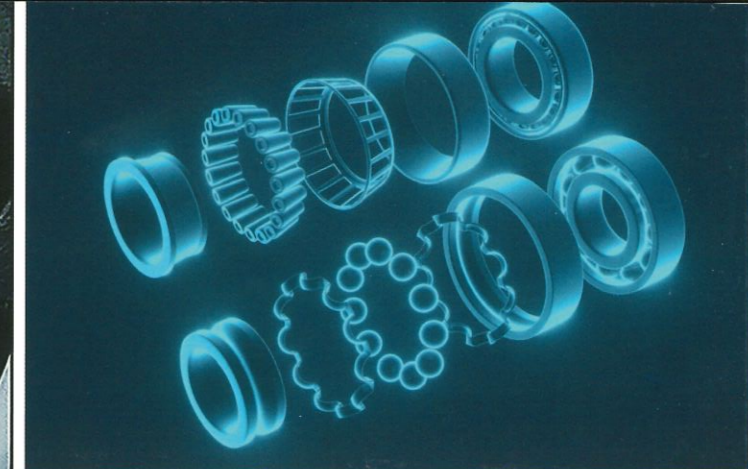
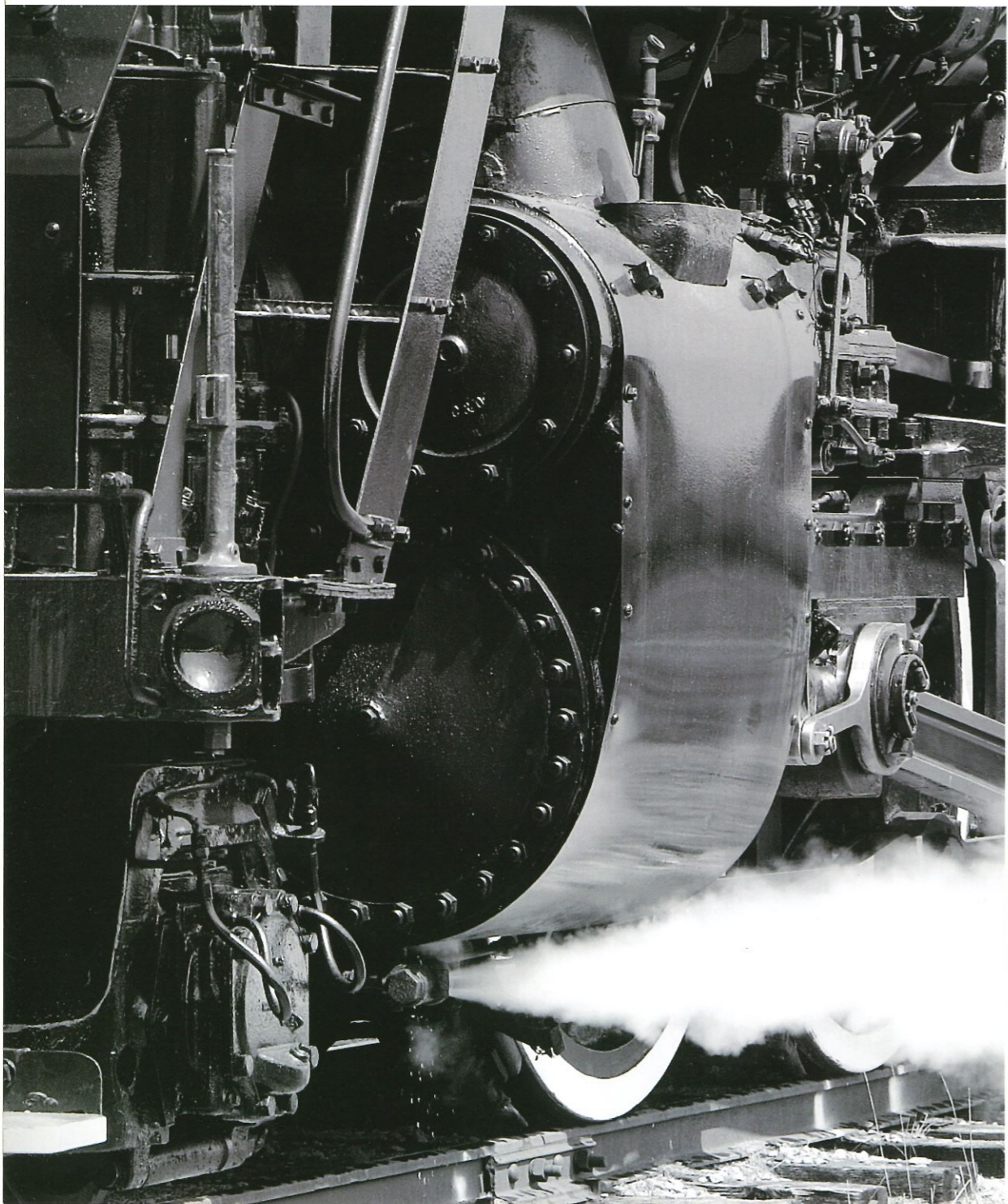
Wheelset Production Line

Baowu trans has two fully automated wheelset assembly lines, which were built in 2014 and designed according to the world's most advanced EMU wheel technology standards, with a design capacity of more than 30,000 sets of various wheelsets per year.

Wheelset Maintenance

The highly flexible wheelset maintenance production line is capable of annual maintenance of 5000 sets of various urban rail and EMU wheelsets.





TYRE

As the components of hooped wheels, the tyre of Baowu Trans is widely used in railway diesel locomotives, electric locomotives, high-power locomotives, electric locomotives, combined wheels of industrial and mining coal water trucks, etc., with the diameter of 600-1376mm.

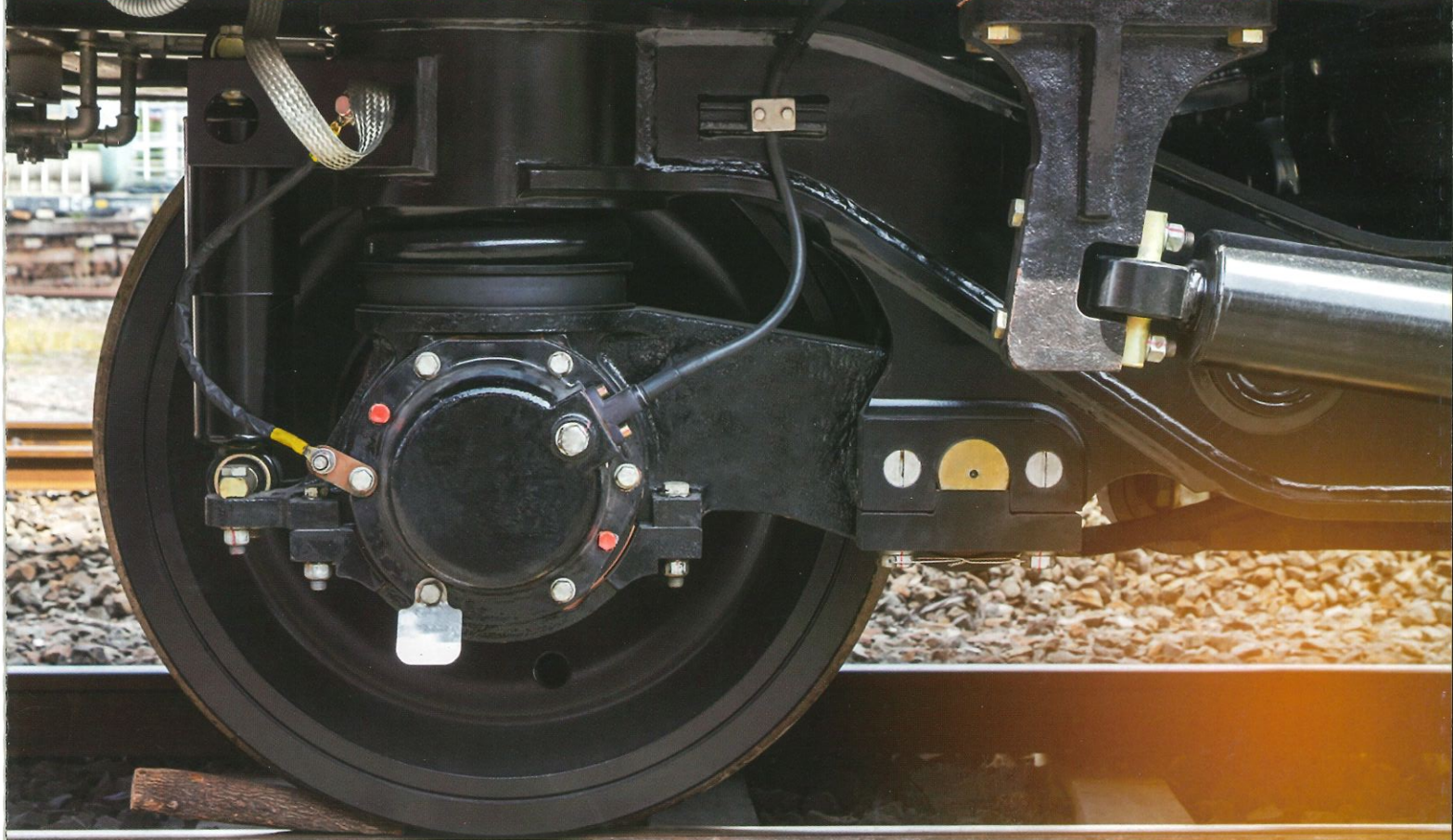
In November 1963, Masteel rolled the first domestic tyre, successfully ending the history of relying on "foreign wheel and tyre". After four times of technical standard upgrading, the quality of Masteel's tyre has been steadily improved, and it is still the largest supplier of domestic tyres till now. Meanwhile, Masteel's tyres are exported to Thailand, Sri Lanka, Vietnam, Kenya, Europe and other international markets.

RING

Baowu Trans' rings are widely used in construction machinery, petrochemical industry, wind power generation, railway transportation, shipbuilding industry, aerospace, national defense and military and many other fields. They are divided into ring gear, flange and special ring parts, etc., with more than 2000 varieties and specifications developed and produced.

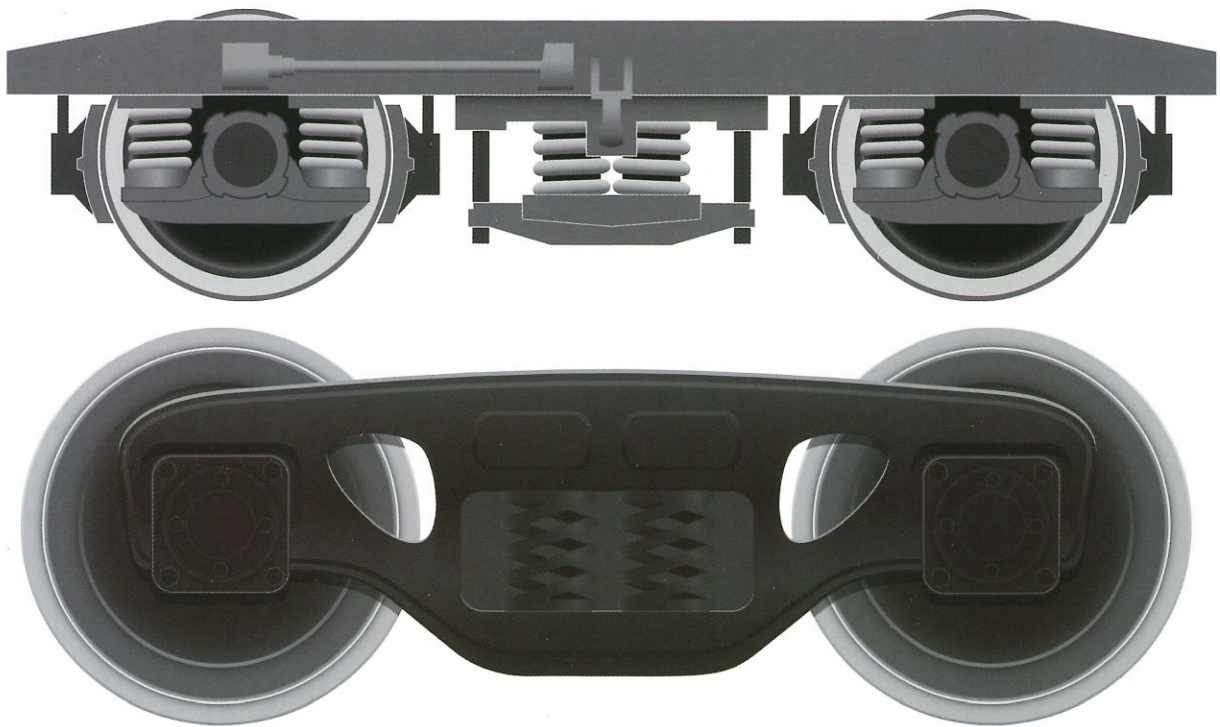
At present, Baowu Trans produces rings with the diameter of 600-3200 mm, according to the international, domestic or industrial standards as well as the technical requirements put forward by customers. As the drafting unit of domestic ring production standard, Baowu Trans has profound technical strength and the product quality level is leading in China.

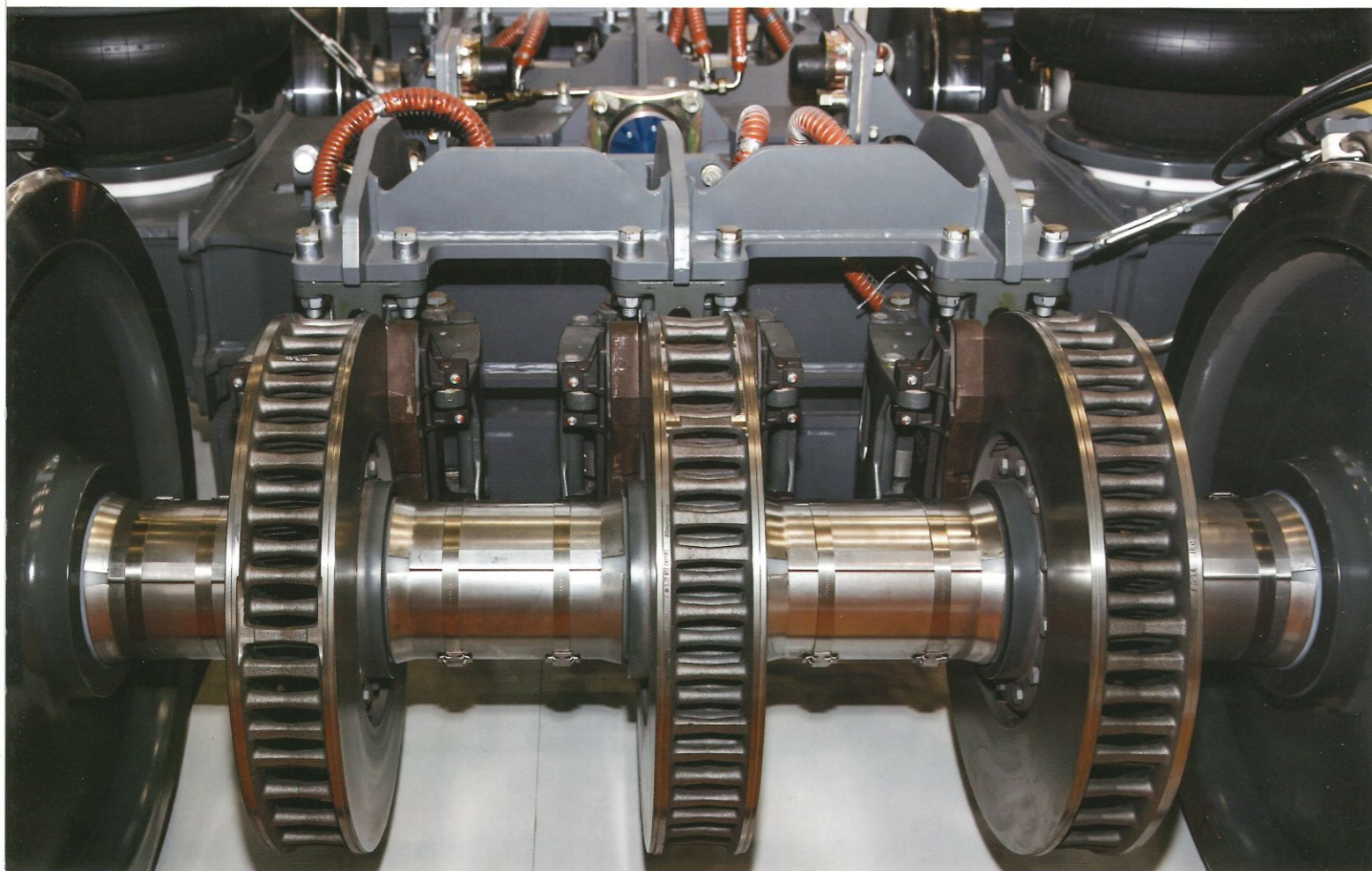




BOGIE MAINTENANCE

At present, Masteel has the ability to maintain bogies with standard gauge and narrow gauge.





AXLE

Quasi High Speed Axle

Quasi high speed axles are widely exported to foreign metro vehicles and EMUs, which meet the control requirements of EN13261 standard on microstructure, non-metallic inclusion and uniformity of section mechanical properties of axles. Meanwhile, the surface residual stress level and fatigue performance index of axles are better than the standard. Baowu Trans has the ability to produce quasi high speed axles with high performance in accordance with EN13261 standard.

Axle for French Railway

Through the European laboratory physical test and on-site quality system audit and certification, the products meet the technical requirements of Class I in EN 13261 standard. The axle type covers the power axle, non-power axle and locomotive axle for EMU and metro. It has the characteristics of "high running speed level, full product specification coverage, high dimensional processing accuracy and strict quality control requirements", the maximum operating speed can reach 300km / h or higher.

Heavy - load Axle

The 40t heavy-load axle is the largest freight axle in the world and is mainly used in mining vehicles. 40t heavy-load axle is not only large in size, but also has extremely strict requirements on steel purity and microstructure uniformity, with high strength, high toughness and high fatigue performance. At present, the axle has been applied to Australian mining vehicles in batches.