Advanced Railway Solution
Lucchini RS Group

Lucchini RS Group is a leader in the design and production of rolling stock products, castings and forgings for all industrial sectors. The strengths of the Group lie in its integrated production facilities, from the production of steel to the assembly of finished products, in the competence of its human resources, and in its know-how and organization, wholly focused on its customers and markets.

For the Railway Sector the Group produces a wide range of products: wheels, axles, tyres, wheelsets for all applications such as high speed intercity, heavy haul and mass transit system. Lucchini RS Group meets the international demand through its companies network in Italy, the United Kingdom, Sweden, Poland, Belgium, Austria, India, China, South Africa and North America.

All sites of the Group strive to be a "one-stop shop" offering full support during all stages of maintenance, from the manufacturing and delivery of spare parts to re-engineering based on return of experience.
Lucchini RS and Lucchini Industries are dedicated to the manufacturing of high quality products, particularly focusing on design, production and assembly of all types of wheels, tyres, axles and wheelsets.

Lucchini RS has a fully integrated production process having all facilities in one site, from research and development of materials to steel production, from design to production and assembling of finished products. The Company also manufactures high quality products for other markets such as steel castings, forgings and tool steels.

Lucchini Unipart Rail (LUR) is the joint venture created by the merging of Lucchini UK Ltd of Manchester with the wheelset and bogie overhaul activities of Unipart Rail Ltd based in Doncaster. Lucchini Unipart Rail is specialised in the machining of monobloc wheels and axles, in the assembly of complete wheelsets for freight, heavy rail, mass transit, light rail and high speed trains and in the overhaul of train wheelsets, bogies and gearboxes.

Lucchini Sweden (LSE) has a long tradition in the production of railway wheels, axles and complete wheelsets. Located in Surahammar, LSE is the only manufacturer in Scandinavia. The main production focuses on the machining of wheels, tyres and wheelsets. In addition to manufacturing, Lucchini Sweden is also a leading supplier of overhaul of wheelsets, gearboxes and bogies.
Lucchini Poland (LPL), strategically located on the route of the international Berlin–Warsaw–Moscow railway line, offers a wide range of railway components and services for freight and passenger vehicles, including the design and production of customized and innovative wheelsets. The Lucchini Poland supply also includes complete bogie overhaul and gearbox revision, as well as mounting of new gearboxes and power packs on new build wheelsets.

Lucchini Central Europe (LCE) is a joint venture between SMW Metallverarbeitung and Lucchini RS, located in Hofkirchen an der Trattnach, in the north-western part of Austria. It is specialized in the machining of solid wheels with complex geometry for High Speed, EMU railways and transit systems. The Company targets the Austrian, Swiss and German markets with the full range of know-how, products and services of the Lucchini RS Group.

LBX, located in Seraing, near Liege, Belgium, is specialized in the machining of solid wheels and axles and in the assembly of complete wheelsets for freight, heavy rail, mass transit and light rail. With its trained workers and advanced systems, LBX is currently expanding its qualification portfolio to cover the needs of regional operators, rolling stock maintainers and builders.

Lucchini South Africa (LSA), situated in Germiston, is fully capable of machining wheels for loco, metro and heavy haul market sectors. The company is also marketing Lucchini RS wheels, axles and wheelsets for the South African rail market.
Zhibo Lucchini Railway Equipment Co. (ZQ) registered as a Sino-Italian joint venture in October 2007, is a high-tech/new-tech enterprise specializing in the machining of wheels and axles, wheelsets and bearing assembly and full wheelset maintenance.

Lucchini Beijing (LCN) is a commercial subsidiary, established to improve the Group’s presence in the Chinese and Asian markets for rolling stock, castings, forgings and tool steels. The company also coordinates after-sales and customer technical services directly on-site.

Lucchini North America Inc. (LNA) is a corporation fully owned by Lucchini RS. The company targets the railway sector and markets in America with the wide range of Lucchini RS products for all rolling stock sectors (high speed intercity, heavy haul and mass transit systems).
Focus on components and wheelsets production line

Steel line
• 60 t Electric Arc Furnace (EAF) / (Power 40 MVA)
• 2 Ladle Furnace (LF) Plant
• 2 Tank Degassing VD - VOD type
• Pits for bottom pouring
• ESR Plant (Max Weight 32 t)
• Carbon, Alloyed, Stainless Steel
• Liquid Steel for castings up to 300 t
• Round, Square & Polygonal Ingots, weight from 3 t up to 85 t
LRS Quality Standards

Main Global Reference Standards

• ASME III
• ISO 14001
• OHSAS 18001
• ISO 9001
• ECOVADIS CRS
• ISO 50001
• JIS

Railway Certifications

Main Global Reference Standards

• IRIS
• AAR M-1003
• RISAS/003/01
• ISO 3834-2
• EN 15085-2
• ISO 9712
• UIC

Main Global Certifications

• ITALCERTIFER
• VPI
• CHINA RAILWAY
• TRENITALIA
• DB
• SNCF
• RENFE
• INDIAN RAILWAYS
• SBB
• ÖBB
• SNCB
• NED TRAIN
# Rolling stock steel grade solutions

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**Severe environmental and loading conditions**

**Applications for desert environments**

**Application with tread-braked wheels**
Products

The widest range

- Wheels: monobloc, tyred, resilient, from ø 300 mm up to ø 1450 mm
- Axles: all types
- Tyres: all types
- Wheels centers: all types wheelsets complete with brake discs, axleboxes and drive units
Noise reduction

Thanks to its research activity in the field of noise reduction, Lucchini RS Group is able to offer a complete range of solutions for all kind of wheels.

**Syope**
For solid wheels mounted under passenger coaches and high speed vehicles.

**Syope**
For solid wheels with web mounted disc brakes.

**Galene**
For resilient wheels to reduce squealing noise.

**Hypno**
For tread braked wheels on freight wagons and passenger coaches.
Lucchini RS Group can offer a wide range of protection systems for wheelset components against oxidation, gritting, corrosive products and ballast impacts, suitable for high speed, very high speed, passenger and freight applications.

**Sura Family**

- **Sura**: Patented low stress wheel for freight applications
- **SuraLight**: Patented low stress wheel with light design for freight applications
- **SuraNordic**: Special wheel designed for Scandinavian EMUs

**Railway solutions | Protection**

**Sura**

Based on aerospace technology, Lursak is a special coating system that guarantees total protection of the railway axle against corrosion and damages from ballast impacts.

**Lursak**

Lurshell is an easy removable and reusable mechanical protection system for axles. It has been developed to protect the axle from high power impacts and to allow magnetic particle inspection during wheelset overhaul. The system has to be mounted on painted axle surfaces to guarantee also protection against corrosion.

**Lurshell**
**Railway solutions | Freiset**

**Freiset**  One solution - many advantages

Innovative wheelsets for freight vehicles. Higher safety for lower service maintenance costs.

- **EA1N** axle with improved safety factors and optimized geometry.
- Thermostable and low stress freight wheel. UIC 510-5 and TSI certified.
- Permanent anti-ballast coating to prevent surface defects that today require EVIC procedures during maintenance.
- Solution for reducing the noise from tread braked wheels.
- Innovative axle-end design (blind hole) to enhance in-service ultrasonic inspection of solid axle by the application of automated rotating phased array probe.

**Railway solutions | Smartset**

**Smartset**

Wheelsets diagnostic solution: constant monitoring of bending and torsional loads on wheelset axles directly installed on the axle surface without any modification of wheelset geometry.

Compatible with Lursak® coating. Data are continuously processed, periodically transmitted and accessible.

They can be used for:
- real-time overload alerts (built-in GPS)
- vehicle design approval
- optimisation of NDT inspection intervals

**ADDED VALUE**

REDUCTION OF THE COSTS OF MAINTENANCE FOR EACH SINGLE FLEET
Railway Maintenance Services

Lucchini RS Group works as a one-stop shop for wheelsets maintenance:

- Wheels replacement
- Overhaul of axles
- Overhaul of axleboxes and bearings
- Overhaul of drive units
- Overhaul of brake discs
- Overhaul of bogies

For fleet operators, it means reduced overhaul times and costs. Lucchini RS Group can also monitor performance of wheelsets in service to optimize Life Cycle Cost.
Railway services

The European Metallurgical Inspection Centre carries out non-destructive tests during production or in-service inspections.

Thanks to constant updating of methods and technologies, EMIC is now one of the European benchmark for NDT staff training and in-service inspection.

Lucchini RS Training & Examination Centre

EMIC operates through two training centres:
- Lovere, Italy
- Minsk Mazowiecki, Poland

EMIC trains and qualifies operators for non-destructive tests, in accordance with all the main International Standards (ISO 9712 – ASNT SNT-TC-1A) and the guidelines provided by the Italian Welding Institute (Certification Body).

EMIC works alongside the operational units of Lucchini RS, giving them access to the most sophisticated equipment and a team of highly specialized and qualified staff.
High speed

Lucchini RS Group supplies most of the global fleet of high speed and very high speed trains.

The extensive know-how of Lucchini RS Group in the high speed sector allows the company to offer customized products and solutions.

Lursak\textsuperscript{®} technology for protection against ballast impact and Syope\textsuperscript{®} panel to reduce acoustic emissions are the most popular solutions adopted for high speed wheelsets.

Our wheels and axles made equipped the Chinese CRH380 fleet, which achieved the world speed record for commercial service and the Italian Frecciarossa 1000, the most advanced train in the world.
Commuter and Metro

Trains equipped with Lucchini RS Group wheelsets carry people all over the world.

Lucchini RS Group supplies the leading global manufacturers of intercity, urban and suburban trains, as well as fleet operators.
Locomotive

Lucchini RS’s rolling mill can manufacture the largest locomotive wheels, up to a diameter of 1450 mm.

Lucchini RS Group supplies products and solutions worldwide for all service conditions and offers special steel grades to improve performance on heavy applications such as locomotives.
LRV

Lucchini RS Group designs and builds products and solutions ranging from low-floor trams to tram-trains.

Limoset® is our innovative solutions for very low-floor LRV thanks to its clean design, low weight and high maintainability level.

Developed by Lucchini RS Group on the basis of design-to-cost principles, it can be adapted to different gauges and reduces unsprung masses.

All Lucchini RS resilient wheels may be equipped with noise reduction systems.

APPLICATIONS
Freight

Lucchini RS wheelsets equip freight fleets all over the world, guaranteeing reliability and reducing fleet management costs.

Thanks to our special steel grades, we can support freight operators to improve fleet performances in all service and environmental conditions, from deserts to the most Northern regions of the world.

Freiset® is the innovative solution offered by Lucchini RS Group for the freight market, featuring the best safety-oriented design and an optimal LCC.
R&D

Themes
• Material performance and heat treatment process
• Reliability and condition-monitoring
• Innovative manufacturing processes and products for improved performance, reduced LCC and increased safety

Capabilities
• Laboratory accreditation ISO/IEC 17025
• Fatigue tests on wheels and axles
• Crack propagation tests
• Residual stress measurements on wheels and axles
• Structural tests on solid or resilient wheels
• Dynamic tests on wheelset roller rig
• Tests on resilient components
• Modal and acoustic tests on wheels