



**Our journey
to the climate
target begins on
CO₂-reduced rails**

Reduced-carbon rails and circular economy

The name Saarstahl stands for high-quality, customized steel solutions. Within the Saarstahl Group, we leverage the potential for providing sustainable answers to global challenges such as mobility, energy efficiency and safety.

About us

Saarstahl Rail has specialized in rail manufacturing for various railway sectors for over 125 years. At our plant in Hayange (France), we produce high-quality infrastructure products with a circular economy concept that cuts CO₂ emissions by using reduced-carbon steel blooms from Saarstahl Ascoval's plant.

Our team has extensive expertise in high-speed rail lines, urban mixed transport, and rails for switches and crossings, and is focused on sustainable mobility solutions.

As a part of the Saarstahl Group, we leverage their reputation for high-quality, customized steel solutions.

The Saarstahl Group, headquartered in Völklingen, Germany, is known for producing premium wire rod, bar steel, billets, and forged products. Our innovative products and intelligent technologies address global challenges like circular economy, mobility, energy efficiency and safety, serving industries such as automotive, construction, power engineering, aerospace and general mechanical engineering.

Circular economy

The concept of CO₂-reduced rails is based on a circular economy model. Saarstahl Rail actively implements this approach by offering customers the option to recycle and recover their used scrap metal (used rails) through contractual agreements.

Saarstahl Ascoval plays a role in this process by recycling scrap metal, sourced primarily from Saarstahl Rail's Hayange plant and from rail networks. These scrap metals are remelted in an electric arc furnace (EAF) to produce high-quality steel in bar form (blooms). The blooms are then delivered to the Hayange plant, where they are used in the production of new reduced-carbon rails through rolling processes.

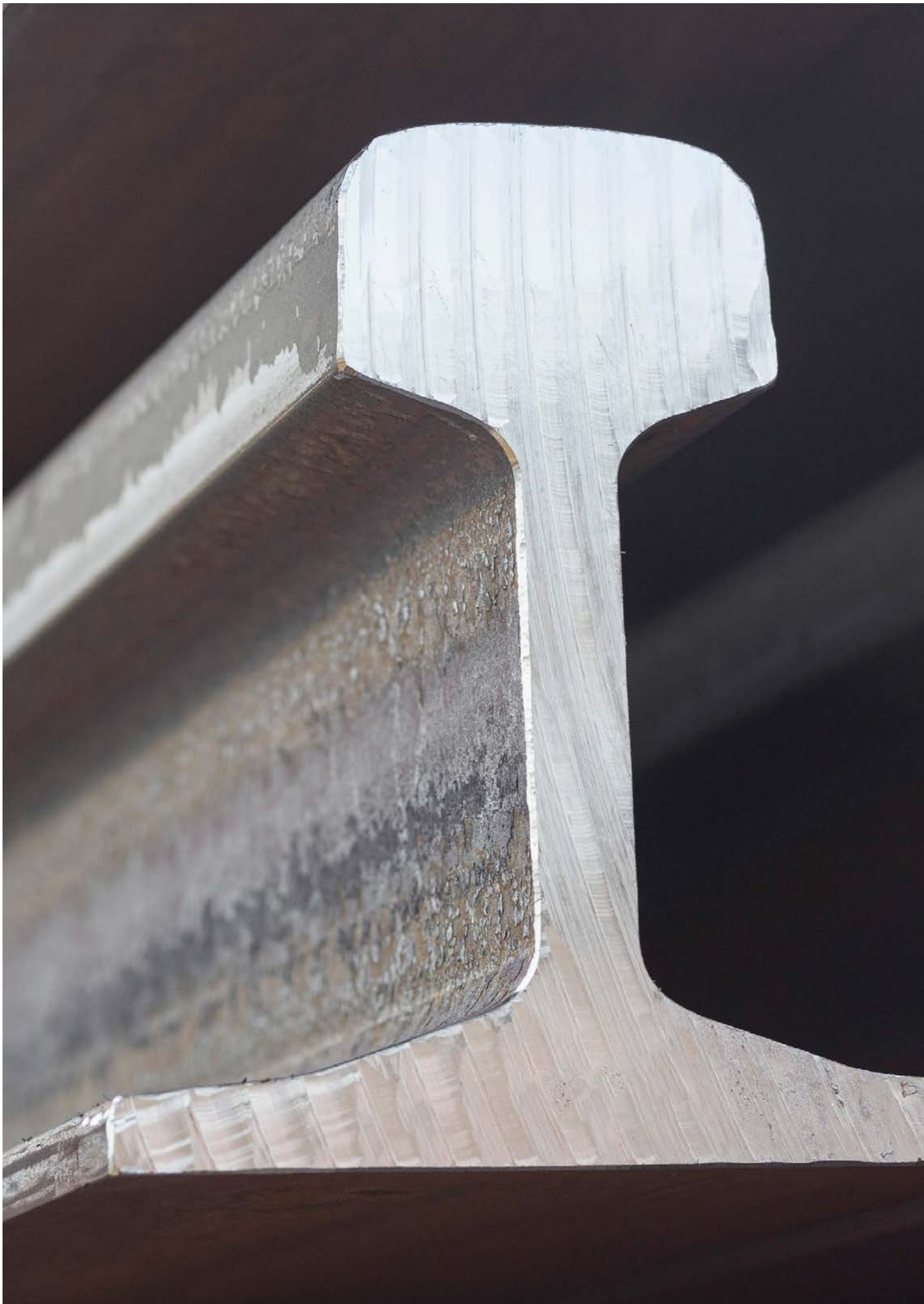
The entire manufacturing process for our CO₂-reduced rails is notably environmentally friendly, as it emits up to 70% less CO₂ when compared to conventional methods that rely on iron ore and coal as the primary raw materials.

To reduce CO₂ emissions, Saarstahl Rail is collaborating with major project owners – including Société du Grand Paris Express, SNCF, RATP, RFI, Infrabel, SBB, and others. By supplying reduced-carbon rails for the Société du Grand Paris Express, Saarstahl is helping cut the CO₂ emissions of this project by up to 20%.



**More than 1 million tons
of CO₂ have been saved
through reduced-carbon
rail production since 2021***





Saarstahl Rail

Our products

To ensure consistently high-quality products, we adhere to strict manufacturing standards from steel production through to rolling and final inspection.

Our product range

With an average annual production capacity of approximately 400,000 tons, Saarlühl Rail offers a comprehensive catalog of over 100 rail profiles, available in more than 25 steel grades and lengths up to 108 meters. Leveraging decades of experience, Saarlühl Rail produces rails that meet current standards and precise customer specifications, and that boast outstanding metallurgical and mechanical properties. Our rigorous quality control systems reliably guarantee the excellence of our products. With an emphasis on sustainability, we also produce CO2-reduced rails with lower environmental impact.

Metallurgy and materials technology

Our experienced metallurgists and materials technologists specialize in designing and selecting track system components tailored to meet specific duty requirements. By collaborating closely with network operators and maintainers, we aim to enhance network performance, reliability and safety.

Failure analysis

With our extensive expertise in rail steel metallurgy and fracture mechanics, we offer comprehensive investigative services to determine the root causes of failures. Our team provides actionable recommendations for corrective and preventive measures. If you are experiencing unexplained track or component failures, our experts are here to help.

Track monitoring

Our multidisciplinary team has extensive experience in monitoring the in-service performance of rail networks. We employ a variety of advanced techniques, including detailed visual inspections, precise instrumentation, and non-destructive testing. Our assessments extend beyond on-track environments to include noise and vibration evaluations. The survey results are instrumental in identifying causes and rates of degradation, which enable rail operators to predict performance and to develop effective asset management strategies.

Laboratory testing

We can conduct a wide variety of laboratory tests to international standards, as well as designing and building bespoke test arrangements. Laboratory testing can also be used to study the performance of worn components as a means to optimize their service life.

From light to heavy, from urban to high speed

Rails from Saarstahl Rail can be found in major European rail networks, in high-speed lines such as those in China and Saudi Arabia, in heavy haul tracks in Canada and Brazil, and in urban networks in France and India as well as Singapore and Hong Kong.

Grooved rails for trams

Saarstahl Rail brings vast expertise to production of grooved rails for the growing urban tramway market. Grooved rails produced at our Hayange facility are integral to most urban rail networks across Europe and are also utilized in numerous prestigious local transport systems worldwide. Our range of grooved rails includes:

- Standard grades conforming to European standards
- Vanadium alloyed grades specifically engineered to enhance wear resistance and facilitate track restoration through welding, and tailored to meet the specific demands of tramway networks.

Saarstahl Rail is committed to delivering grooved rails of superior quality that contribute to the reliability and efficiency of global tramway systems.



Rails for high-speed and conventional lines

Saarstahl Rail supplies over 80% of SNCF's annual requirements, predominantly in the 60E1 and 50E6 profiles. France's entire high-speed rail line network uses rails manufactured at our Hayange facility.

In addition to SNCF, Saarstahl Rail serves major European rail networks such as SBB in Switzerland and DB in Germany.

Our global reach extends to supplying rails for high-speed lines in countries such as China and Saudi Arabia, as well as heavily traveled urban networks including RATP, Delhi, Singapore, and Hong Kong. We also provide rails for heavy haul tracks in diverse locations including Mauritania, Canada, and Brazil.



Rails for switch and crossings

Saarstahl Rail also produces profiles for the manufacture of switches and crossings. These rail profiles are generally asymmetrically forged to the precise dimensions required by our partners and customers in the rail industry. The rails for switches and crossings are available in various grades:

- Standard (R260, R260Cr)
- Heat treated (R350HT, MHH)
- Bainitic (B360)

The bainitic grade is specifically designed for applications on the points and counterpoints of high-speed network frogs. It effectively prevents the formation of rolling contact fatigue cracks on the rails, thereby eliminating the need for costly grinding operations to remove these defects.



Rails for heavy-haul track

Heavy-haul tracks often face significant challenges that elevate the risk of rail failure, including accelerated wear and severe deformation. Saarstahl Rail addresses these issues with a comprehensive range of specialized rail grades designed to provide practical solutions that lower the life cycle costs associated with these tracks.

These tailored rail solutions are supplied globally, helping customers worldwide optimize the performance and durability of their heavy-haul track networks.



Special solutions to specific problems

Saarstahl Rail produces other, more specialized types of rails including Sogenox, bainitic rails, wear-resistant grooved rails and anti-corrosion coated rails.

Bainitic rails

Bainitic steel grade type B360, is approved by recognized networks and is designed for use in high-speed rail networks in points and counterpoints for frogs with movable points, and can be used for both new installations and maintenance. These rails can achieve lifetimes of up to 300 million gross tons (MGT) without contact fatigue defects and without the need for grinding. The B360 grade is currently performing exceptionally well at a number of monitored sites.

Complementing this, the B320 bainitic grade offers a perfect balance between wear resistance and the prevention of contact fatigue defects. Its specific microstructure delays the initiation of fatigue cracks and slows their propagation, while the natural wear of the rail helps eliminate incipient cracks.

Both B360 and B320 bainitic grades are engineered to enhance durability and performance, ensuring the long-term reliability of high-speed rail networks.



Sogenox rail

To maintain optimal electrical contact on tracks, prevent rust, and increase safety, Saarstahl Rail has developed special rails with a stainless-steel layer on the running surface: the Sogenox. These rails can be rolled for all types of profiles, including Vignole and tongue rails, and are available in standard Euronorm grades. Sogenox rails offer significant advantages over traditional stainless-steel bead deposits, including excellent straightness, improved profiles, greater cost-effectiveness, no delamination, and enhanced passenger comfort.



Anticorrosion rails

Corrosion remains a major problem for railway infrastructure, especially in certain specific operating areas (level crossings, wet tunnels, coastal tracks). Saarstahl Rail offers these adapted anticorrosion treatment solutions:

- Hot galvanization of rails
- Anticorrosion deposit

Hot galvanization of rails

Galvanized rails are now utilized to effectively address severe corrosion challenges, particularly in critical areas such as level crossings. Since 2018, these rails have been installed in the most sensitive zones of recognized networks. They provide robust protection against corrosion and are available in lengths of up to 15 meters.

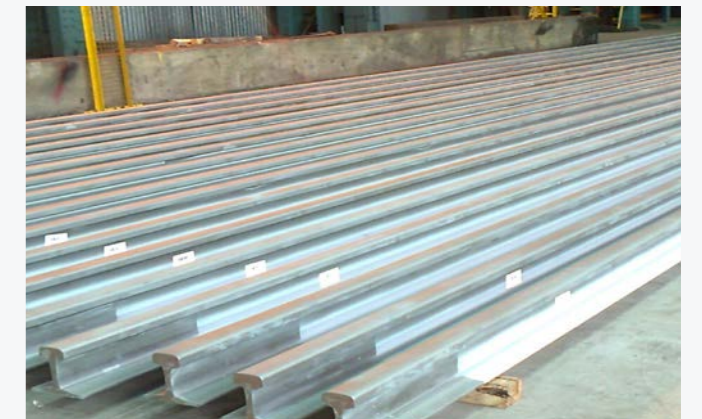


Anticorrosion deposit

Rails can be coated with a deposit that acts as a barrier to limit moderate corrosion. The composition of this protective deposit can be customized to meet specific customer requirements.

Wear-resistant grooved rails repairable by welding

Saarstahl Rail offers wear-resistant grooved rails that provide an optimal balance between wear resistance and easy weldability. These rails can be easily restored through weld deposition on worn surfaces, such as the gauge corner and upper surface of the rail head. The grades offered are enriched with vanadium in a ferrite-pearlitic composition, ensuring durability and ease of maintenance.





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