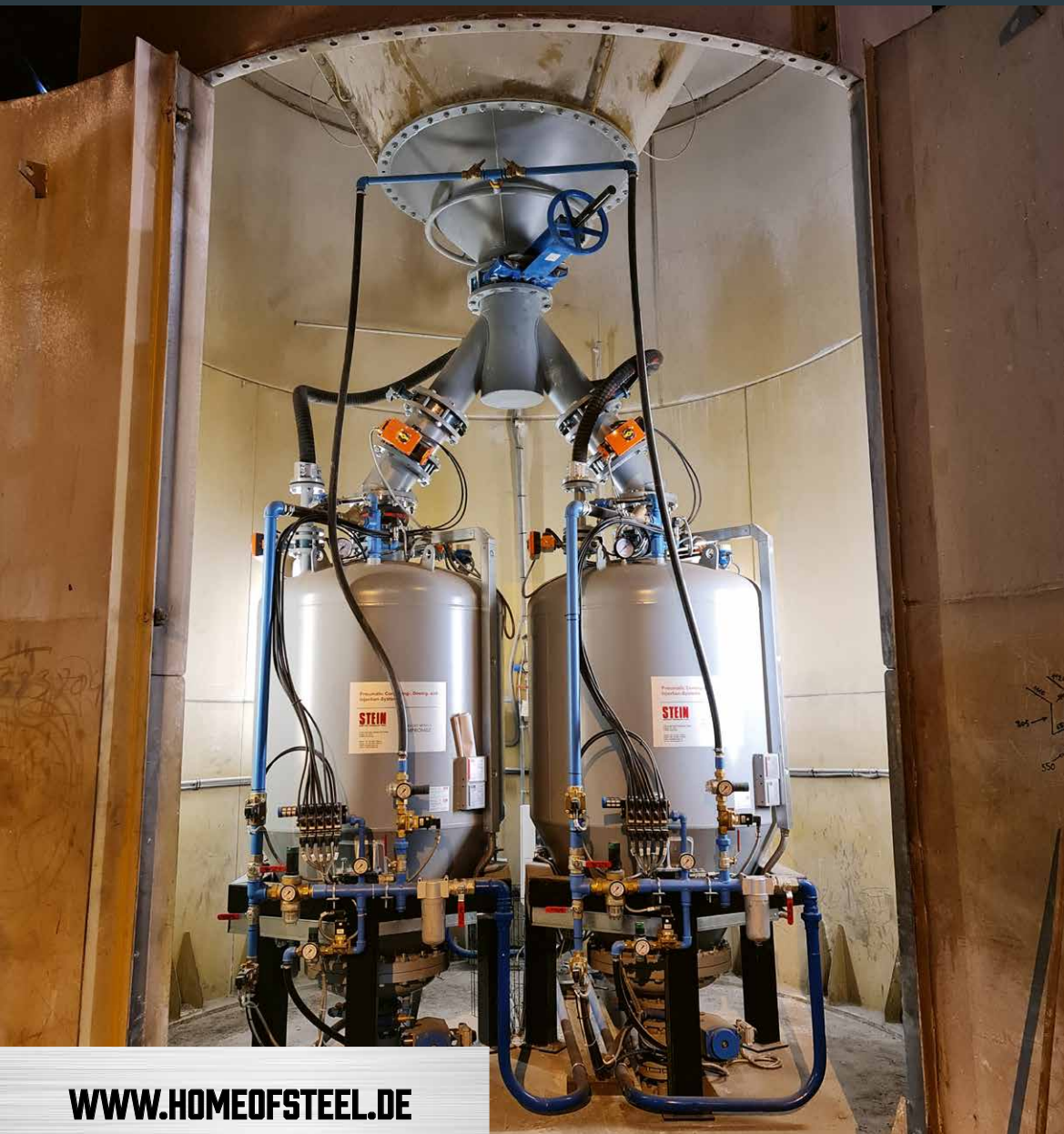


STEEL+ TECHNOLOGY

02
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THE TECHNICAL MAGAZINE FOR IRON AND STEEL PROFESSIONALS AROUND THE WORLD



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STEEL COMPANIES

Hyundai Steel and POSCO to build new integrated flat steel complex in Louisiana, USA

STEEL TECHNOLOGY

A new concept in slab mould plate design to better balance performance and efficiency

STEEL DISTRIBUTION

Modular system of slitting lines for small and medium steel service centers

STEEL MATERIALS

Ultra-strong low-temperature hot-formed steels with zinc coating



More information about Paul Wurth EASyMelt:
sms-group.com/plants/easymelt



SMS  **group**

Paul Wurth EASyMelt

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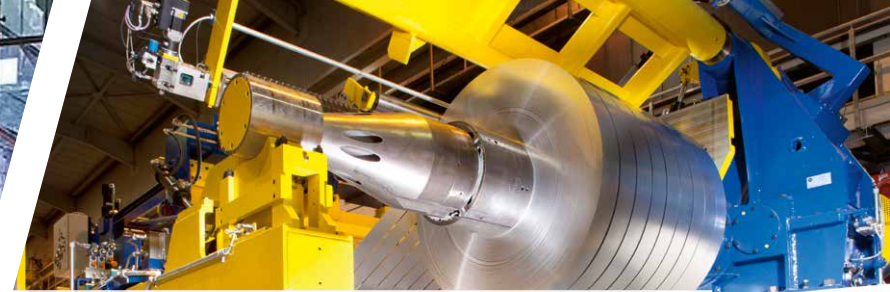
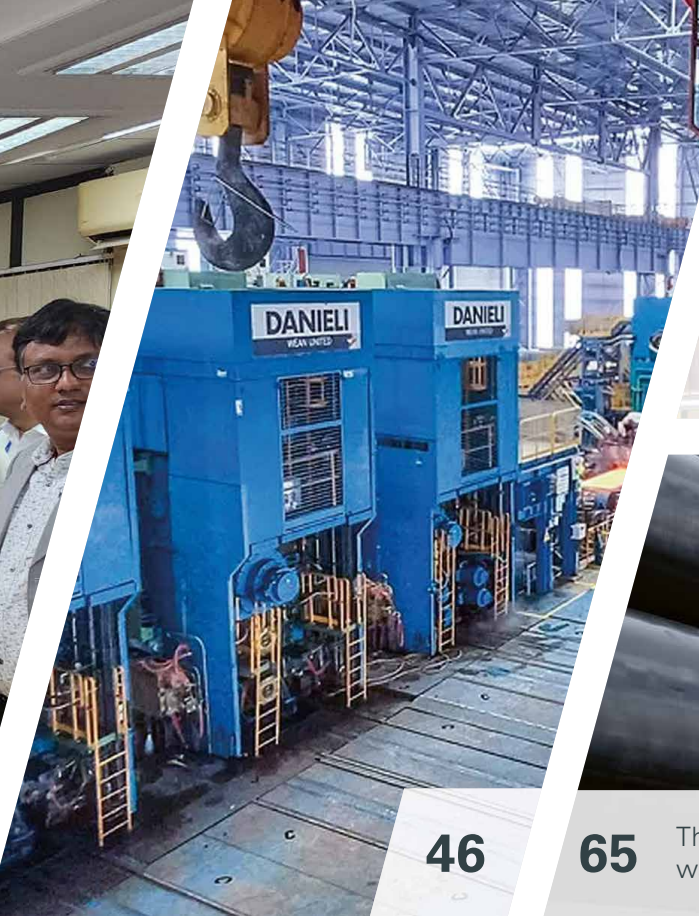
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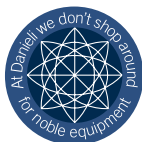
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With the order placed by CMC Steel for its fourth new, MIDA QLP hybrid-ready minimill, the Danieli scorecard hits 26 plants for long-product endless casting-rolling, out of 115 total minimills.



ARCELORMITTAL NIPPON STEEL INDIA APPOINTS NEW CEO AND CFO

Current Chief Financial Officer of AM/NS India, Amit Harlalka, has been appointed as new Chief Executive Officer effective 1 July. New CFO is Nobuo Okochi.

Amit Harlalka succeeds Dilip Ommen as CEO. Ommen will retire after 22 years with the company (previously Essar Steel). He will retain links to the company as a board member of AM/NS India, as well as taking up the position of vice-chairman of ArcelorMittal India.

Amit Harlalka joined AM/NS India in December 2019 as Deputy Director, Finance before being appointed CFO in January 2023. Prior to that he had spent many years at ArcelorMittal, where he worked in several locations including Mexico, Zenica, and Luxembourg.

Nobuo Okochi, the new Chief Financial Officer, has four decades of experience with Nippon Steel Corporation, having held senior leadership roles across

finance, financial planning and capital budgeting, as well as global business development. Both leadership transitions reinforce continuity and stability in the senior management team of ArcelorMittal Nippon Steel India.

■ *ArcelorMittal Nippon Steel India*

THYSSENKRUPP STEEL EUROPE NAMES HEAD OF NEW SALES DIVISION



Georgios Giovanakis will head the newly created Sales division of thyssenkrupp Steel Europe and assume the role of Chief Sales Officer as a full member of the executive board.

"In establishing a stand-alone Sales division, we are taking a targeted approach to strengthening the company's market-oriented management," said Ilse Henne, chairwoman of the supervisory board of thyssenkrupp Steel Europe AG.

Georgios Giovanakis can look back on over 25 years of management experience in the steel and materials industry. From 2019 to 2025 he served as CEO of thyssenkrupp Electrical Steel GmbH. Prior to that, he held numerous executive and board positions in Germany and abroad. He has already been a member of the extended executive board since January 1, 2026, overseeing the sales operations within the CEO's remit.

■ *thyssenkrupp Steel Europe*

Georgios Giovanakis will take charge of the newly created, standalone Sales division as Chief Sales Officer (Picture: thyssenkrupp Steel Europe)

NLMK DANSTEEL APPOINTS NEW CEO

NLMK DanSteel has appointed Fredrik Nilsson as Chief Executive Officer. He succeeds Interim CEO Cornelius Louwrens, who has supported the organization during the transition period.

Fredrik Nilsson brings more than 25 years of international industrial leadership experience within operations, supply chain and transformation in the metals and

materials industry. Most recently, he served as Vice President Supply Chain & Operations in the Powder Metallurgy Division at Höganäs AB, overseeing large-scale operations across Europe, the United States and China.

As part of NLMK Europe, NLMK DanSteel operates within an integrated European production platform that includes

facilities in Denmark, Belgium and Italy. It specializes in the production of heavy steel plates for demanding applications.

■ *NLMK Europe*

RYERSON RESTRUCTURES SENIOR LEADERSHIP TEAM

Ryerson, a value-added processor and distributor of industrial metals, has announced a series of leadership team appointments designed to accelerate the strategic integration following the merger with Olympic Steel.

Executives with a new or expanded role within the organization include: Mark Silver, Executive Vice President and Chief Legal & Risk Officer; Frank Williams, Chief Information Officer; Richard Manson, Sr. Vice President – Finance (Ryerson) / Chief

Financial Officer – Olympic Steel; Daniel Rosenberg, Chief of Staff; and Brian Seeley, President – Ryerson Advanced Processing.

■ *Ryerson*

NEW MANAGING DIRECTOR AT MIDREX INDIA

Aashima Vadhera, member of the Midrex executive staff, has been promoted to Managing Director of Midrex India. In her new role, she will have oversight of all functions of Midrex India, including India Engineering.

Since joining Midrex in 2012 at the India office, Aashima Vadhera has led the financial and administrative operations for both the India and Shanghai offices. Her team provides essential financial and administrative support to project execution, marketing, and sales activities across Asia, the

Middle East, and North Africa. She also serves on the board of Midrex Gulf Services, supporting financial supervision. She is a qualified chartered accountant and holds bachelor’s degrees in law and commerce.

Midrex Technologies

Aashima Vadhera has been promoted to Managing Director of Midrex India
(Picture: Midrex)



RETIREMENT OF STEEL DYNAMICS BOARD MEMBERS

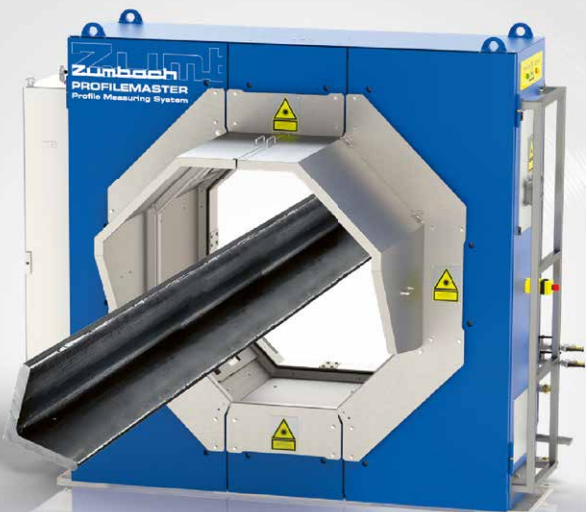
Richard P. Teets, Jr. and Gabriel L. Shaheen have retired from the Steel Dynamics board of directors effective as of the company’s 2026 annual meeting of shareholders.

Mark D. Millett, Chairman and Chief Executive Officer, thanked Richard P.

Teets, Jr. for his meaningful contributions and invaluable impact as a co-founder, longtime board member, and exceptional leader. Additionally, he extended his appreciation to long-standing board member Gabriel L. Shaheen, whose financial acumen, strategic perspective, and

thoughtful counsel have been invaluable throughout his many years of service and influence.

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4-8 Number of cameras	5 Min. object diameter (mm)	540 Max. object diameter (mm)	2000 Scan rate (scans/s)

STEEFORCE PACKAGING APPOINTS CEO, NORTH AMERICA

Steelforce Packaging has appointed Brion S. Talley as CEO, North America. In this role, Talley will lead the company's regional strategy, commercial operations, and long-term growth initiatives across North America.

Brion S. Talley brings more than three decades of executive leadership experience across the steel and metals industry. Most recently, he served as CEO/President of JFE Shoji America.

Steelforce Packaging is the North American arm of Steelforce Group, a glob-

al steel trading and distribution organization headquartered in Antwerp, Belgium. Its North American operations have been organized under the newly established Steelforce America entity.

■ *Steelforce*

Brion S. Talley, joins Steelforce America as CEO, North America (Picture: Steelforce)



SMS MILL SERVICES APPOINTS EXECUTIVES

SMS Mill Services LLC, a provider of steel mill services, has appointed Chris Dods and James Herald to its board of directors. Henrik Nielsen has been appointed as Chief Financial Officer.

Chris Dods and James Herald will further strengthen the board with complementary experience across steel and industrial services. Most recently, Chris

Dods served as President and Chief Executive Officer of Strategic Materials, a leading provider of glass and plastics recycling services. James Herald joins SMS Mill Services from Evraz North Americas where he served as Chief Executive Officer.

Henrik Nielsen brings more than 25 years of global financial leadership experi-

ence across industrial, logistics, and services businesses. At SMS Mill Services he will be responsible for guiding all aspects of the company's financial strategy.

■ *SMS Mill Services LLC*

WORLD STEEL ASSOCIATION WELCOMES NEW DIRECTOR GENERAL

Dr. Henrik Adam will become the new Director General of worldsteel (World Steel Association). He succeeds Dr. Edwin Basson, who will retire this year, after leading worldsteel for more than 15 years.

Dr. Adam is currently the Executive Chairman of Tata Steel Netherlands Holding BV and serves as President of Eurofer, the European Steel Association, and Chairman of the Steel Institute VDEh in Germany.

He brings with him more than 25 years of leadership in both the steel and automotive sectors, having held roles at Tata Steel Europe and thyssenkrupp, overseeing operations across production, R&D, sales, supply chain, and strategy. He served as CEO at Tata Steel Europe and CEO of Electrical Steel at thyssenkrupp.

■ *worldsteel*



Henrik Adam (left) succeeds Edwin Basson as Director General of worldsteel (Picture: worldsteel)

TENARIS ANNOUNCES CEO SUCCESSION

The Board of Directors appointed Gabriel Podskubka as Chief Executive Officer. Paolo Rocca will continue to serve as Chairman of the Board.

The Board expressed their profound gratitude to Paolo Rocca for his outstanding leadership in building Tenaris into the clear global leader that it is today, and is pleased that Rocca will continue to serve as Chairman. Since even before Tenaris became a public company in 2002, Rocca

has shown a remarkable vision in creating a unified company providing critical and uniquely differentiated products and services to customers in the energy sector. He has been the architect of the continuous growth of the company over the past 25 years.

The appointment of Gabriel Podskubka reflects the culmination of a long-term leadership planning process. Podskubka has served as Tenaris's Chief Operating

Officer since 2023. He joined Tenaris in Argentina in 1995 and has held leadership positions across marketing, commercial and industrial functions, including heading Tenaris's Eastern European operations in 2009 and serving as president of its Eastern Hemisphere operations from 2013 to 2023.

■ *Tenaris*

BENTELER NAMES NEW CHIEF FINANCIAL OFFICER

Thomas Glynn will become the new Chief Financial Officer of the Benteler Group. In this role, he will also serve as managing director of Benteler International Austria GmbH, the Group's holding company.

Thomas Glynn succeeds Dr. Tobias Braun who will leave the company at his own request and by mutual agreement to pursue new professional challenges. Before joining the Benteler Group, Thomas Glynn most recently worked at Topside Group LLC, where he acted as a banking and capital markets expert. He brings extensive experience in corporate finance,

treasury, capital markets, and performance management across international markets. He will join CEO Ralf Göttel on the Benteler Group executive board.

■ *Benteler*

Thomas Glynn, the new CFO of the Benteler Group (Picture: Benteler)



LEADERSHIP TEAM CHANGES AT NUCOR

John L. Sullivan has been promoted to Nucor's Chief Financial Officer, Treasurer and Executive Vice President.

John L. Sullivan began his career with Nucor in 2022 as general manager of investor relations. He will succeed Steve

Laxton, who was promoted to President and Chief Operating Officer earlier this year.

Nucor also announced that Daniel R. Needham, Executive Vice President of Commercial, plans to retire effective June

20, 2026 after nearly 26 years with the company.

■ *Nucor*

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FINLAND

SSAB receives funding for research collaboration program

SSAB has been selected by Business Finland, a Finnish public innovation funding organization, as one of the leading companies in the challenge competition launched in spring 2025.

Business Finland will grant SSAB 20 million euro funding to initiate a five-year research and development program titled

Sustainable World through Steels. The objective of SSAB's program is to create an ecosystem comprising more than 200 partners, including research institutes and universities, digitalization partners, other steel producers, technology developers, and customer companies. SSAB aims to transform Finland's and its wider Nordic steel production model into a modern, effi-

cient, and sustainable manufacturing system and, together with its customers, develop new advanced high-strength decarbonized steel grades.

■ SSAB

FRANCE

PPG invests in testing line for radiation-curable coatings

PPG is installing an advanced testing line for radiation-curable coatings at its R&D center of excellence in Marly. The line will accelerate development cycles and reduce the number of customer trials.

Unlike conventional thermal curing, radiation curing requires less energy because

it operates at or near ambient temperature. The new testing line will be able to test multiple curing technologies, including infrared (IR), ultraviolet (LED, excimer and arc lamps), and electron beam (EB) and accurately replicate customer production conditions. UV- and EB-curable systems typically use 100% solids formula-

tions with no solvents, reducing or eliminating volatile organic compound emissions.

■ PPG

75th anniversary of the Treaty of Paris

Seventy-five years after the signing of the Treaty of Paris, the European steel industry met with the European Commission's Executive Vice-President Stéphane Séjourné to mark this historic milestone, take stock of Europe's industrial journey and look at the challenges ahead.

Signed on 18 April 1951 by Belgium, France, Germany, Italy, Luxembourg and the Netherlands, the Treaty established the European Coal and Steel Community (ECSC). It led to the creation of a common market for steel, which entered into operation in 1953, marking a decisive step in Europe's economic integration.

Meeting in Paris where this process began, industry leaders and the European Commission reflected on the role steel has played in Europe's development, and its continued importance for competitiveness and resilience.

Henrik Adam, President of the European Steel Association (Eurofer), said: "Seventy-five years ago, Europe took a decisive step by creating a common market for steel. Today, we welcome the renewed efforts of the European Commission to usher in a new era of industrial policy. Progress has been made, but in an increasingly competitive global environment, even more effort will be needed."

The European Commission's Executive Vice-President, Stéphane Séjourné, remarked, "The celebration of the 75th anniversary of the European Coal and Steel Community reminds us how intrinsically intertwined Europe's and the steel sector's histories are. We have taken clear steps to protect the sector from unfair competition, with the most robust safeguard clause ever launched. But it doesn't stop there. We will continue to support steel producers to address the many challenges that characterise this new geopolitical order."

■ Eurofer

FRANCE

Marcegaglia to build steelmaking and flat rolling facility in Fos-sur-Mer

Marcegaglia and Danieli have signed an agreement for the implementation of a new steelmaking and flat rolling facility in Fos-sur-Mer. The final investment decision is subject to the completion of the permitting process but expected by the end of 2026.

The new facility will be designed to produce more than 2 million t/year of liquid steel and up to 3 million t/year of stainless and carbon steel hot-rolled coils, covering around 35% of Marcegaglia Group's total coil and slab demand. Production will primarily supply the group's Italian downstream facilities for a wide range of applications.

The plant will include a modern electric arc furnace, a single-strand continuous slab caster for thick slabs, and a conventional hot-strip mill. This configuration will ensure production flexibility, stable operations, and consistent product quality



Marcegaglia and Danieli representatives after the signing of the joint agreement
(Photo: Marcegaglia / Danieli)

across a broad range of flat steel grades. The use of scrap, low-carbon HBI, and nuclear and renewable energy sources will enable up to 80% reduction in greenhouse

gas emissions compared to traditional steelmaking routes.

■ *Danieli*

Gravithy enters FEED stage for low-carbon iron plant

Gravithy has selected Hatch to deliver the front-end engineering design (FEED) for its low-carbon iron production facility in Fos-sur-Mer. The project represents a major step toward establishing Europe's first large-scale merchant iron facilities based on 100% low-carbon hydrogen as the reducing agent.

Gravithy's Fos-sur-Mer facility is designed to produce 2 million t/year of direct reduced iron (DRI) / hot briquetted iron (HBI) supplying European steelmakers with a low carbon feedstock to support the transition to electric arc furnace steelmaking. A key technical focus of the FEED phase is balancing hydrogen generation, iron reduction operations, and power supply reliability, while maintaining operation-

al flexibility. The scope also includes process and energy balances, constructability and logistics studies, and preparation of tender packages to support project funding and seamless progression into detailed engineering and execution. Project execution is currently planned to begin in 2028, subject to final investment decisions.

■ *Gravithy*

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GERMANY

ArcelorMittal completes converter revamp in Eisenhüttenstadt

ArcelorMittal Eisenhüttenstadt and Primetals Technologies have successfully installed a new converter suspension system at the 255-t LD converter (BOF) No.2 in Eisenhüttenstadt.

Primetals Technologies conducted an engineering study to determine the optimal solution for ArcelorMittal Eisenhüttenstadt, resulting in a highly customized and cost-effective approach that maximized the continued use of existing converter equipment. Primetals Technologies was also responsible for equipment manufacturing and supply, as well as providing advisory services during construction, commissioning, and startup. ArcelorMittal Eisenhüttenstadt supplies high-quality flat steel products and services to a variety of industries, including automotive, household appliances, and construction. The plant has an annual capacity of up to 2.5 million t of crude steel.



Representatives of ArcelorMittal Eisenhüttenstadt and Primetals Technologies after completion of the suspension system project (Photo: Primetals Technologies)

■ *Primetals*

thyssenkrupp and Jindal pause talks regarding a stake in thyssenkrupp Steel

thyssenkrupp AG and Jindal Steel International have mutually decided to pause discussions about Jindal acquiring a stake in thyssenkrupp Steel Europe, as the original assumptions and prerequisites for a deal have significantly changed in recent months.

thyssenkrupp has made significant progress in realigning its steel segment. Additionally, the regulatory environment for the steel industry in Europe has changed significantly, becoming fundamentally more favourable. This offers the sector significant potential for stabilization and growth.

The European Union recognizes the critical importance of steel production for the resilience of industrial value chains. It has expressed commitment to protecting the European steel industry from global overcapacity and dumping, while accelerating the transition to climate-friendly steel production.

"Now that we have reached an agreement in principle within our own company, with labor unions, and with policymakers in Germany and Europe, the conditions for the profitable continuation of thyssenkrupp Steel is better than they have been in a long time. Jindal has been a construc-

tive and committed partner throughout the discussions. However, we have jointly agreed to pause negotiations for now," explained Miguel López, CEO of thyssenkrupp AG.

Another important step was the agreement reached with Salzgitter in early February on a paper outlining key points regarding the future of HKM, which has given the Southern Duisburg site new prospects.

■ *thyssenkrupp*

ITALY

Galperti Special Alloys orders melting and refining equipment

Galperti Special Alloys S.p.A., a newly established company within the Galperti Group, has awarded Danieli the contract for the engineering and supply of a vacuum induction melting furnace and an electro-slag remelting furnace.

The 8-t VIM furnace will provide controlled melting under vacuum, enabling precise management of chemical composition and steel cleanliness, supporting a wide portfolio of specialty and heat-resistant grades. Complementing this, the 10-t ESR furnace

will enhance the production route by improving inclusion control, segregation behaviour, and overall material homogeneity, ensuring the highest quality standards for demanding applications.

The project includes engineering, manufacturing, preassembly, and testing of the equipment at Danieli workshops, as well as installation support and commissioning activities. Startup is scheduled for the second half of 2026.

■ Danieli



Galperti and Danieli representatives shaking hands on the order placement (Photo: Danieli)

Tenova solutions on INCITE platform for clean EU technologies

Tenova has five of its innovative techniques mentioned on the European Innovation Centre for Industrial Transformation Emissions (INCITE) web platform.

Launched in 2024, INCITE identifies and evaluates emerging cutting-edge technologies and processes committed to decarbonization, depollution, and the increase of resource efficiency and circularity.

Among the technologies featured on the platform are Tenova's solutions for steel production, including the electric arc

furnace with Consteel® and Consterr® technologies, the open slag bath furnace for DRI melting, and the iRecovery® and Heat Leap systems for heat recovery from EAF plants. Also mentioned on the platform are Tenova's systems for the injection of recycled polymers as a substitute for coal in the EAF, and ENERGIRON for direct reduced iron production, a process jointly developed with Danieli.

■ Tenova

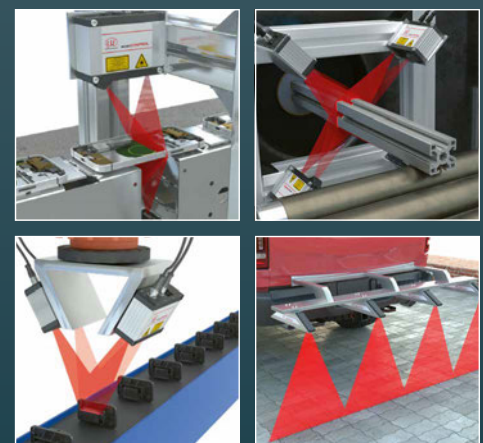


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SERBIA

Utva Silosi AD Kovin orders new ERW tube line

Utva Silosi AD Kovin has selected Danieli to supply a new ERW line for the production of structural and automotive-grade tubes

The new line, supplied by Danieli Centro Tube, will operate at speeds exceeding 160 m/min and be equipped with state-of-

the-art automation systems, producing tubes with outside diameters of up to 50 mm and maximum thickness of 3 mm. It will feature continuous coil unwinding with a double-mandrel decoiler and strip joining for uninterrupted operation. The line will be completed by an in-line non-destructive system, a high-performance flying saw

and a lance-type bundling system followed by an automatic strapping unit. The plant is currently in the design phase and scheduled to start operations in the first half of 2027.

■ *Danieli*

SWEDEN

SSAB signs molybdenum off-take agreement with Greenland Resources

SSAB has signed an eight-year off-take agreement for molybdenum with Greenland Resources.

The binding agreement provides an established price floor and price ceiling, and will

allow SSAB to secure high-quality low-carbon emission ferromolybdenum extracted in Greenland and refined in Belgium. SSAB will be able to ensure a stable and responsibly sourced, long-term secured primary molybdenum supply with high sustainabil-

ity standards and low scope 1&2 emissions from an EU associate country.

■ *SSAB*

SSAB and Heidelberg Materials launch research project for sustainable concrete

SSAB and Heidelberg Materials are entering a collaboration to develop electric arc furnace slag into an alternative binder in cement. The project is co-funded by the EU and the Swedish Agency for Economic and Regional Growth.

The new four-year research project builds on knowledge from previous successful

research and collaboration initiatives. Its aim is to develop EAF slag into an efficient and more sustainable alternative binder in cement, known as a supplementary cementitious material, to reduce the climate footprint of the construction sector. The focus is on developing methods to optimize the slag, from lab to pilot scale, and on evaluating performance in cement

and concrete applications to create an industrially scalable solution that can be applied to future products.

■ *SSAB / Heidelberg Materials*

The temporary halt to construction work at the SSAB site in Luleå has been lifted

SSAB has initiated an extended measurement program to identify the root cause of illness-like symptoms reported by individuals employed by subcontractors at the construction site of SSAB's new steel mill in Luleå.

All work at the construction site was paused as a safety measure in early April, while steel production at the Luleå site

was proceeding as normal. SSAB has expanded its program for sampling and measurements in air, soil and equipment/machinery.

In the last week of May SSAB has initiated a controlled restart of the steelworks construction in Luleå after completion of the analysis of the causes behind disease symptoms. After consultation with experts in the respective fields, the overall analysis

is that symptoms have arisen because of a combination of factors, with exposure to fine dust particles from construction activities being the primary factor. The negative impact of fine dust particles is amplified as a result of low humidity and the presence of seasonal respiratory viruses.

■ *SSAB*

TURKEY

Ekinciler Demir Celik to implement billet welding technology and endless rolling

The Turkish steel company has selected Danieli K-Welding technology for a continuous rolling process, higher yield, and productivity up to 180 tons per hour.

Ekinciler Demir Celik has chosen Danieli to supply a sixth-generation Horizontal Billet Welder (HBW), for its rolling mill in Turkey. The new welding unit will enable head-to-tail joining of billets, introducing the first endless-rolling operation in the

country. Start-up is scheduled for Q2 2027.

The system is designed to guarantee productivity up to 180 tons per hour and will ensure smooth integration with the existing mill layout, minimizing downtime and enhancing overall plant performance. The welding unit is engineered for fully automatic operation and endless rolling, reducing operational costs and significantly increasing material yield by eliminating

both billet gap time and the short bars traditionally delivered on the cooling bed.

The adoption of the new horizontal billet welder will also support Ekinciler's sustainability objectives by reducing energy consumption per ton of rolled product, minimizing material waste and lowering indirect emissions associated with reheating and billet handling.

■ *Danieli*

Gazi Metal orders work roll grinder

Gazi Metal has placed an order with Pomini Tenova for the supply of a foundation-free work roll grinding machine to expand its roll shop capacity at the Karasu Sakarya facility.

The new work roll grinder is a technologically advanced machine designed for maximum precision. Its foundation-free design offers Gazi Metal significant advantages such as installation flexibility and simplified integration into existing facility layouts, low-

er civil work costs and shorter timelines for site preparation. Delivery of the new machine is scheduled for early 2027, with commissioning to follow shortly thereafter.

■ *Tenova*

Kardemir to modernize meltshop automation

Kardemir has awarded Primetals Technologies a contract to modernize the automation environment across its meltshop to improve data consistency, process execution, and operational transparency.

The project includes modernizing the automation for three basic oxygen converters, four ladle furnaces, and one vacuum degasser. The new Level 2 process optimization system will integrate all BOF, LF, and VD units into a single digital architecture from Primetals Technologies, connecting metallurgical, operational, and planning data in one environment. This solution provides operators and metallurgists with a shared interface and standardized procedures. With this modernization, Kardemir aims to reduce reblows in the BOF shop, lower energy usage in secondary metallurgy, improve yield, and boost overall productivity.

■ *Primetals Technologies*



Meltshop processes at Kardemir will be optimized by installing a unified digital architecture (Photo: Kardemir)

UNITED KINGDOM

Alleima expands heating element production

In response to the increasing demand for sustainable high-temperature heating solutions, Kanthal, a division within Alleima, initiated an investment initiative in 2023. This initiative involves expanding the current facilities in Perth, Scotland, by adding 1,750 m² of manufacturing area.

Kanthal, a global supplier of sustainable industrial heating technology, has been present in Perth for over 50 years. It has long been home to the company's Global[®] silicon carbide heating elements portfolio. The facility expansion includes new equipment, an updated layout, and additional warehouse space, all aimed at enhancing production capacity and capabilities.

As governments and companies are ramping up efforts to reduce industrial emissions as part of broader climate commitments, Kanthal has also established a new service center for Global[®] heating elements at its existing facility in Concord, North Carolina, U.S.A. Both locations are



Ribbon-cutting ceremony for the facility expansion: Robert Stål, President Kanthal (left) and Scott Lawson, Production Unit Manager, Perth Kanthal (Photo: Fraser Band)

now fully operational, increasing the available production capacity for these products by approximately 40%.

Alleima /Kanthal

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NEW ELECTRICAL STEELS LINE IN FRANCE

ArcelorMittal's Mardyck site produces its first industrial coil and begins operations

On Thursday, 26 March 2026, the teams from the electrical steels department at the Mardyck site (Nord) successfully produced the first industrial coil on the new production lines.

This is an essential milestone for ArcelorMittal France, as it will enable the teams to refine and adjust industrial tools and processes, allowing for a steady ramp-up, leading to the final validation of all lines for the delivery of high-quality products to customers. The electrical steels produced by ArcelorMittal at the Mardyck and Saint-Chély-d'Apcher (Lozère) sites are critical to the development of e-mobility and therefore contribute to the energy transition. They are essential for manufacturing electric motors and generators used in automotive applications, wind turbines etc.

Achieving full operational capacity

Up to 400 people contributed to the development of the project, the construction of the new lines in Mardyck, and the preliminary tests required to produce a first coil

on the first three lines of the new production chain: the preparation line, the annealing-coating line, and the slitting line. With the first coil – over 17 tonnes and nearly 4 kilometres long – the new production line has entered a decisive phase.

The ramp-up of a new industrial tool requires strong commitment and high standards in terms of safety, quality, and reliability, as highlighted by Bruno Ribo, CEO of ArcelorMittal France: "I warmly commend the constant efforts of the teams. I know how much energy was required to reach this essential milestone. I would like to thank all the teams involved, as well as our partners. We will now focus on ramping up production and making the first deliveries – with safety, of course, remaining our top priority."

Several months will be needed before the new lines reach their full operational capacity. The skills, expertise, and dedica-

tion of the 175 employees on the new team, together with the experience and know-how of the ArcelorMittal group, will be key drivers of success.

A strategic growth project

The new electrical steels production line at the ArcelorMittal France Mardyck site is a strategic growth project for the ArcelorMittal group. It will triple its electrical steel production capacity in Europe.

Together with the existing production unit in Saint-Chély-d'Apcher, ArcelorMittal's electrical steel capacity in Europe will reach 295,000 tonnes per year. All electrical steels produced by ArcelorMittal in Europe will be manufactured in France, strengthening the French ecosystem dedicated to e-mobility and the energy transition.

■ *ArcelorMittal Europe*



The Dunkirk team of ArcelorMittal France with the first NGO steel coil produced at the new production lines (Picture: ArcelorMittal Europe)

UNITED KINGDOM

Landmark UK steel sector strategy

A comprehensive 150-page assessment reveals the long-term demand, production capacity, and supply chain opportunities shaping the future of UK steel



3D-Draft of the future EAF steelmaking plant at Tata Steel UK in Port Talbot, Wales
(Picture from the archives: Tata Steel UK)

Hatch, a global engineering, project delivery, and professional services firm, was engaged by the UK Government to develop one of the most comprehensive assessments ever undertaken of the UK steel sector. In March 2026, the UK Government released the report consolidated in a rigorous 150-page analysis [1]. It assesses the country's long-term steel demand outlook, domestic production capacity, technical capability and supply chain gaps, and options to close the gaps. These documents form a core part of the evidence base underpinning the UK's steel strategy and highlight the critical opportunities ahead for the sector.

The findings provide unprecedented clarity to the opportunities and challenges facing the sector at a pivotal moment, as the UK advances major clean energy ambitions, expands critical infrastructure, and accelerates its net zero transition.

The reports forecast that UK steel demand could reach 14.0 to 15.4 million tonnes per annum by 2050, with a cumulative market value between £223 billion and £248 billion, depending on localisation scenarios.

"We are seeing a fundamental shift in the UK steel landscape," said Jonathan Lee, senior principal in Hatch's Advisory practice. "Growth across construction, wind energy, electric vehicles, automotive manufacturing, and transmission and distribution is accelerating long-term demand. At the same time, the UK is facing a domestic production shortfall of about 7.3 million tonnes per annum by 2050. That gap represents a major opportunity to reinvest, strengthen local supply chains, and build the future capacity the country will need."

While the UK Government produces hundreds of research reports each year, this assessment is notable for its scale, depth, and forward-looking analysis. It includes:

- › Long-term demand projections to 2050
- › Upstream and downstream supply chain gap analysis

- › Evaluation of green steel adoption pathways (with potential for up to 98% green steel production by 2050)
- › Detailed technical options to close capacity and capability gaps
- › Sector-specific insights across construction, automotive, energy, nuclear, and more

The analysis provides industry leaders, investors, and policymakers with the evidence required to guide capital planning, support industrial decarbonisation, and accelerate UK manufacturing resilience.

By drawing on its unique combination of steel operators, engineers, and market and commercial experts, Hatch incorporated industry-leading insight from its global teams based in the UK, Germany, Canada, and the US. The project leveraged Hatch's integrated capabilities across energy transition scenario planning, market modelling, industrial engineering, supply chain analysis, and decarbonisation strategy.

Hatch was selected for its global metals expertise, long history supporting complex industrial transformations, and its unique ability to combine quantitative modelling with practical engineering pathways.

References

- [1] UK steel strategy demand assessment. Independent report available on the UK Government website: <https://www.gov.uk/government/publications/uk-steel-strategy-demand-assessment>

Key insights from the reports

- › The UK produces enough scrap and clean energy potential to support expanded electric arc furnace (EAF)-based green steelmaking but will require upstream investments in virgin ironmaking such as direct reduced iron (DRI) capacity.
- › Increasing localisation of manufacturing in wind and automotive could unlock an additional 1.4 million tonnes per annum of demand by 2050.
- › There are major opportunities in heavy plates, flat products, hot-dip galvanised (HDG) products, and electrical steels, representing more than £90 billion in cumulative market gap value.
- › Planned transitions at Tata Steel and British Steel could enable 100% low-carbon domestic crude steel production in the long term.

MODERNIZATION

EAF upgrade honoured at NLMK Indiana

The Association for Iron & Steel Technology (AIST) recognizes NLMK Indiana with the Gold Reliability Achievement Award for its innovative EAF upgrade project with Primetals Technologies. The award honours the adoption of new practices, policies, or procedures that significantly improve iron- and steelmaking reliability in North America.



The first heat for NLMK Indiana's 118-ton EAF after the modernization

(Picture: Primetals Technologies)



Primetals Technologies and NLMK teams standing alongside the Gold Reliability Achievement Award (Picture: Primetals Technologies)

NLMK Indiana has received the "Gold Reliability Achievement Award" from AIST, a non-profit iron- and steel organization with 18,500 members in 70 countries. This award recognizes the recent upgrade of the company's 118-ton electric arc furnace (EAF) at its facility in Portage, Indiana, U.S.A., completed in collaboration with Primetals Technologies.

Primetals Technologies carried out a comprehensive modernization of the furnace, completing a shutdown time of only six weeks until the first heat, followed by a short ramp-up period with more than 20 heats per day after just four days.

Increased safety

A central focus of the modernization was NLMK's desire to increase safety and simplify maintenance at its Portage site. To tackle these challenges, Primetals Technologies developed two key solutions: a single-point roof-lifting system and an integrated gantry. These upgrades eliminate the need for operators to physically access the

furnace roof when disconnecting chains for maintenance, substantially improving safety. Additionally, maintenance downtime has decreased, increasing productivity due to a faster delta-replacement process with the new equipment.

Recognition for innovation and reliability

The AIST Reliability Achievement Award recognizes organizations and the individuals within them who develop, apply, and prove new practices, policies, or procedures that significantly improve iron- and steelmaking reliability in North America. Presented at gold, silver, and bronze levels, the award is granted exclusively to iron and steel producers.

The Reliability Achievement Award not only highlights the technical success of the furnace modernization but also the strength of the partnership between NLMK and Primetals Technologies. This project has become a strong example of how excellent engineering, strategic plan-

ning, and project execution can produce meaningful advancements in the industry's safety, reliability, and productivity.

The full scope of the EAF upgrade is detailed in the technical paper co-authored with Primetals Technologies, "NLMK Indiana EAF Modernization and Equipment Replacement," which was presented at this year's AISTech conference in Pittsburgh, Pennsylvania, on Monday, May 4.

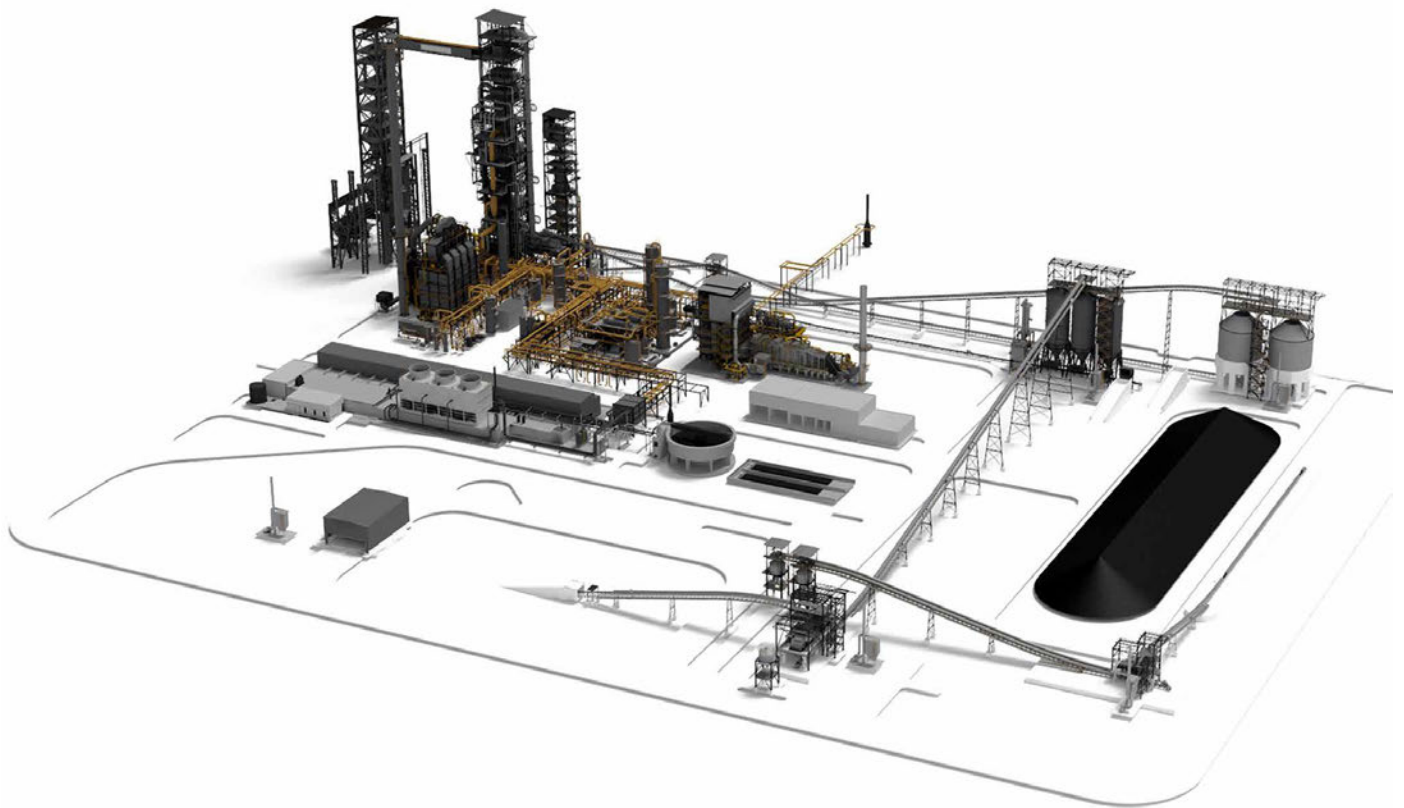
About NLMK Indiana. NLMK Indiana produces a range of steel products including hot rolled and pickled and oiled steels. Located close to the Port of Indiana along Lake Michigan, NLMK Indiana primarily serves markets for pipe and tube manufacturing, energy, agriculture, construction, and automotive. NLMK Indiana is part of NLMK USA which employs more than 1,100 people across its facilities in Indiana and Pennsylvania and produces 2.7 million tons of steel annually.

| Primetals Technologies

GREENFIELD PROJECT

Hyundai-POSCO Louisiana Steel to build integrated flat steel complex in the USA

The project comprises a fully integrated, EAF based steel mill serving low emission, high quality automotive steel production. The new facility will produce high-quality flat steel products, primarily intended for low-carbon, high value-added automotive steel grades for the North American market.



3D scheme of the direct reduction plant (Picture: Danieli / Tenova)

Hundai-POSCO Louisiana Steel LLC (HPLS), a joint venture comprising Korean enterprises Hyundai Steel, POSCO, Hyundai Motor Company, and Kia, has made a groundbreaking decision to invest USD5.8 billion in a new manufacturing facility in Louisiana, USA. "This facility represents a major step in strengthening our North American supply chain, advancing next-generation steel production and contributing to economic growth in the region," said Chul Soon Jang, HYUNDAI-POSCO Louisiana Steel president. Utilizing a direct reduction plant-electric arc furnace (EAF) process, the mill will

deliver high-quality, low-carbon steel products.

HPLS's new steel plant is scheduled to go live in 2029 and will boast a total capacity of approximately 2.7 million tons of steel products. The product range of the new low-carbon steel facility will comprise 650,000 tonnes of hot-rolled coil (HRC) and 2.05 million tonnes of cold-rolled coil annually.

Approximately 70% of total output – equivalent to 1.8 million tonnes per year – will be dedicated to automotive steel applications. The largest portion of steel manufactured in Louisiana will be sent to

Hyundai Motor Company's vehicle manufacturing plants throughout the U.S.

Location. The low-carbon flat steel complex will be located on approximately 1,700 acres in Donaldsonville, Louisiana, anchoring the RiverPlex MegaPark on the West bank of the Mississippi River in Ascension Parish. At approximately 17,000 acres, RiverPlex is the largest undeveloped tract along the deep-water Mississippi River. Hyundai Steel Company is expected to create more than 1,300 direct new jobs. Louisiana Economic Development estimates the project will result in about 4,100 indirect

new jobs, for a total of 5,400 potential new jobs in the Capital region.

Direct-reduction ironmaking site

The ENERGIRON® consortium by Tenova and Danieli has been selected as the supplier for the direct reduction plant. The ENERGIRON® Direct Reduction Plant (DRP), jointly developed by Tenova and Danieli, will be the second of its kind in the USA, with a nominal capacity of 2.5 million t per year of hot and cold Direct Reduced Iron (DRI).

It will feature Zero Reformer ENERGIRON technology, and it will deliver DRI with 94% metallization and 2.5% carbon content. Designed to be future-ready, the plant will also be equipped with carbon capture technology and is prepared for the use of hydrogen as a reducing gas, making it the most sustainable steelmaking solution currently accessible on the market.

The direct reduction plant will convey hot DRI through the HYTEMP pneumatic transport system to the adjacent steelmaking shop and charge the hot product into two EAFs at temperatures exceeding 600°C, optimizing thermal energy utilization and significantly reducing steel production operating costs (OpEx).

Steelmaking plant

The contracts awarded to Danieli includes the supply of two electric arc furnaces with secondary metallurgy, two thick slab casters, and two slab reheating furnaces. Danieli steelmaking technologies consistently deliver reduced OpEx, low-carbon emissions, and superior product quality – key factors in the production of demanding automotive grades.

Melting. The meltshop will feed the casting area at a production rate of 2.88 million t per year. It will include two electric arc furnaces (EAFs) equipped with Zero-bucket ECS® continuous scrap charging, allowing flexible operation with charge mixes ranging from 100% scrap to hot and cold DRI. Secondary metallurgy will consist of two twin-ladle furnaces and one twin RH-OB system, supported by a complete material-handling system and fume-treatment plants for both meltshops.

Casting. The two slab continuous casters incorporate Danieli's latest 3Q technolo-

This facility represents a major step in strengthening our North American supply chain.

Chul Soon Jang, President of HYUNDAI-POSCO Louisiana Steel LLC

gies and are designed to produce conventional thick slabs for quality grades, including low-carbon-emissions steel. Special attention has been given to mould-level stability and surface quality, meeting the stringent requirements of automotive applications.

Reheating. Two walking-beam reheating furnaces, each rated at 280 t per hour, complete the production line. The furnaces are optimized for low fuel consumption and high operational flexibility, and are already designed to operate with natural-gas-hydrogen mixtures up to 100%, ensuring compliance with future decarbonization targets.

High-performance rolling mills

Hyundai-POSCO Louisiana Steel has commissioned SMS group to supply the rolling technology for the new greenfield plant in Donaldsonville, Louisiana, USA. The order covers a hot strip mill (HSM) and a pickling line/tandem cold mill (PL/TCM), including an acid regeneration plant (ARP) and AMOVA logistics solutions. Equipped with state-of-the-art automation and process control systems, the rolling mills are designed to produce premium automotive grades. The digital-ready automation systems allow for the seamless integration of additional functions and easy expansion with future digital solutions.

Hot strip mill. The hot strip mill processes incoming slabs into high-quality coils. Hot-rolled strip dimensions will range from 1.2 to 25.4 millimeters thick and up to 1,900 millimeters wide.

A sturdy four-high roughing mill with a slab sizing press and a vertical edger is fitted with the camera-based X-Pact®

Sense system for ski-up control. Cost-efficient and precise temperature control is guaranteed by HIBOX® heat insulation hoods and the latest generation of ELOTHERM inductive edge heaters. The seven-stand finishing mill is fitted with SMS's iconic CVC® plus technology (Continuous Variable Crown), a laminar cooling with edge masking unit, and a double downcoiler section. The hot strip mill will be operated with fewer crew members working from a central X-Pact® One Pulpit.

SMS delivers AMOVA logistics solutions for the safe transport of coils on pallets as well as a strip inspection line. Its integrated transport management system (TMS) organizes coil transportation from the hot rolling mill right through to the cold rolling mill.

Pickling line/tandem cold mill. The compact layout of the pickling line/tandem cold mill combines pickling technology with a tandem cold rolling mill. The coupling of the pickling process and the rolling process enables a continuous production flow without the need for intermediate material storage. This means that an annual output of almost two million tons of high-quality cold strip can be achieved. In addition, the line can be operated in pickling mode alone, producing pickled and oiled hot-rolled coils at an annual capacity of 112,000 tons. The broad product portfolio that includes strip widths of up to 1,850 millimeters and cold-rolled thicknesses from 0.40 to 3.50 millimeters is geared toward sophisticated automotive steel grades.

The line comprises two main sections: the turbulence pickling section and the cold rolling mill. The high-performance pickling section includes an X-Roll® laser welder and a turret-type side trimmer. The



Representatives from SMS group and Hyundai Steel at the SMS Campus, Mönchengladbach, Germany (Picture: SMS group)

pickling process, designed for efficient scale removal, is dynamically controlled by the X-Pact® Turbulence Pickling Model, which increases productivity while at the same time reducing energy and acid consumption. A particular feature is the integrated acid regeneration plant with fluidized-bed technology.

The cold rolling mill consists of five mill stands and a fully continuous exit section with a carousel reel and an inline "Rotary Inspect" surface inspection station. The entire configuration is particularly relevant for the production of third-generation advanced high-strength steels (AHSS), which require precise roll gap control at high rolling forces.

After cold rolling, the coils are transported to the downstream processing area by an AMOVA high-speed car (HSC) system controlled by the integrated transport management system.

Coil finishing. France-based Fives Group was awarded the contract for the design and supply of advanced coil finishing lines dedicated to automotive steel applications. Fives Group brings its extensive expertise in coil processing technologies, with recent successful project deliveries across the United States, Mexico, and China.

Logistics

Hyundai-POSCO Louisiana Steel plans to import an estimated 3.6 million tons of iron ore annually to the facility. HPLS is partnering with the Port of South Louisiana to build a deep-water dock on the Westbank of Ascension Parish to accommodate steel and materials shipments.

Completed coils will be shipped out via rail and truck to customers, including Hyundai Motor Company, Kia, and U.S. automakers.

Electric energy supply

Entergy Louisiana has finalized an electric service agreement with HYUNDAI-POSCO Louisiana Steel (HPLS), to power the site and support its long-term energy needs. Entergy Louisiana is a subsidiary of Entergy Corporation (NYSE: ETR), an integrated energy company engaged in electric power production, transmission and retail distribution operations.

To enable major economic development projects such as the new steel mill, Entergy Louisiana has been working with the Louisiana Public Service Commission and other partners for several years to upgrade its generation and transmission systems. More recently, Entergy Louisiana is planning major transmission projects on

the Westbank of the Mississippi River and in south central Louisiana that provide additional load-serving capacity for new economic development projects. These transmission projects, which include significant new high-voltage transmission lines, will enable Entergy Louisiana to serve major new developments like Hyundai Steel Company and improve service reliability to all customers.

Conclusion

Hyundai-POSCO Louisiana Steel LLC – established by Hyundai Motor Group in collaboration with POSCO – will operate a fully integrated steel mill dedicated to automotive steel production in the USA. This facility will manufacture products that generate approximately 70% less CO₂ emissions compared to those produced via traditional blast furnace routes. This project aims to establish a robust U.S.-based supply chain for advanced automotive steel, addressing increasing demand from automakers while supporting the expansion of commercial-grade steel distribution across North America.

■ *Danieli / SMS group / Fives Group / Entergy*

NEW FLAT STEEL COMPLEX

Expansion project at SAIL IISCO in India

Steel Authority of India Limited is expanding its IISCO Steel Plant. This major project involves modernising existing plants and constructing a large new flat steel complex. Once complete, it will significantly increase the steel production capacity, enabling them to manufacture high-grade hot-rolled coil and API-grade steel for the oil and gas industries.

Steel Authority of India Limited (SAIL) is among India's largest steel producers, with five integrated plants and three special steel facilities. SAIL has decided a roadmap of modernization and expansion projects for the IISCO Steel Plant (SAIL-ISP) in Burnpur, Paschim Burdwan District of West Bengal. In recent months, SAIL has awarded orders for main equipment to international technology suppliers, making the project structure very transparent. Following the expansion

in 2029, the installed production capacity at IISCO Steel Plant will increase from currently approx. 2.5 million tons to 7.1 million tons of steel per year.

New blast furnace. The contract for a new, greenfield mega blast furnace has been awarded to Danieli Corus. The new BF will have a 4680 m³ working volume and a 5557 m³ inner volume and is designed to add 4.08 million t/year of steelmaking capacity to the current output

of IISCO Steel Plant. IISCO's new blast furnace will be the largest on the Indian subcontinent and, as such, represents another solid step forward for the growth of the steel industry in India.

The new furnace will be equipped with the latest in modern BF ironmaking technology. The hot blast system will be based on dome combustion hot blast stoves, which will be the sixth reference for this design for Danieli Corus. The gas cleaning system will have a dry second stage based



Representatives from SAIL ISP and Primetals Technologies during contract signing for the supply of a pelletizing plant, three ladle furnaces and two RH-degassers (Picture: Primetals Technologies)

on the Danieli Corus Pleno V technology, which has its roots in the primary aluminium industry, where it is proven to be a robust performer for close to 50 years.

Expansion of the cokemaking plant. Currently, IISCO Steel Plant operates two top-charging coke oven batteries. The addition of three new stamp charging batteries No. 12, 13 and 14 will not only enhance production capacity but also introduce cutting-edge technology to the Indian public sector.

A new stamp charging battery No. 12 is being built to produce 0.76 million t per year of high-quality coke to meet the requirements of IISCO's blast furnaces. SMS group, in a consortium with MECON Limited, was awarded a turnkey coke oven project including a 6.25-meter-high stamp charging battery, coke oven machines, as well as the CokeXpert® Level 2 system for automatic battery heating control. This new coke oven battery will feature 60 ovens, divided into two blocks of 30 ovens each, and two stamping-charging-pushing machines (SCPM) based on Paul Wurth stamping technology, which ensures homogeneous coal density and high coal cake stability, setting new benchmarks for coke-making in India. The environment friendly and efficient technology represents a significant step forward compared to conventional coke-making methods used in India today.

For the new stamp charge coke oven batteries no. 13 and 14, SMS group, together with its consortium partner MCK Kutty Engineers Pvt. Ltd., has signed a contract for the supply of two coke dry quenching (CDQ) units. The project will be delivered on a discrete turnkey basis, including design, engineering, supply, installation, commissioning, electricians and automation, digitalization, and related services. Under the new CDQ contract, SMS will supply all major technological components – while MCK Kutty Engineers Pvt. Ltd. will support the on-site execution by providing erection activities.

Each CDQ has the capacity to process 130 tons of coke per hour. These two units will be the largest single-chamber CDQs in any of the integrated steel plants SAIL operates. By leveraging the benefits of Paul Wurth cokemaking technologies, the systems will deliver high coke quality, stable cooling performance, and reliable, continuous operation – ensuring consistent,

moisture-free metallurgical coke for downstream blast furnace processes. In addition to operational reliability, the CDQs provide significant environmental benefits, including efficient heat recovery and lower emissions compared to conventional wet quenching. This supports SAIL's broader sustainability objectives and enhances the plant's overall energy performance.

First pelletizing plant. For the first time, SAIL will build and operate its own pelletizing plant through its partnership with Primetals Technologies, moving away from previous build-own-operate (BOO) models.

The new pelletizing plant will be based on the proven and reliable 576-square-meter straight-grate concept and will feature an annual production capacity of 4.2 million tons. Primetals Technologies will supply key equipment, including the complete induration area, pelletizing discs, motors, and drives.

A core element of the plant concept is Primetals Technologies' advanced digitalization solution. The process optimization system will handle critical tasks such as calculating the ideal raw material mix to achieve targeted pellet basicity and quality, while also supporting supervisory functions like preventive maintenance planning.

Steelmaking facilities. No information was available about the expansion of the BOF capacities when preparing this project overview. However, Primetals Technologies will provide a comprehensive secondary metallurgy package. The three new ladle furnaces and two RH degassers will ensure steel refinement and enhanced product quality. These secondary metallurgy units enable precise control of chemical composition and temperature and will also be used for heating liquid steel for subsequent casting operations.

The RH-degassers will feature two single RH stations equipped with a steam vacuum pump system, ferro-alloy, and micro-alloy addition systems. Main design elements include monoblock RH vessels and Primetals Technologies' proprietary combined vessel and ladle lifting system (CVL), combined oxygen blowing (COB) lance system, and a Level 2 RH process optimization system.

The ladle furnaces will include two offline and one online furnace, equipped with transfer cars, ferro-alloy and flux addi-

tion system, secondary emission control system, wire feeding, and electrode nipping stations. Design highlights include a 3-point hydraulic roof lifting system, bottom stirring, top stirring lance, arc heating system including HT transformer, circuit breaker, Primetals Technologies' electrode regulation system and a Level 2 LF process optimization system.

Slab casting plant. SAIL has awarded Danieli the contract to supply three slab continuous casting machines. The slab casters will produce high-quality slabs up to 250 mm thick and 2,100 mm wide.

Hot strip mill. Danieli will also supply the new hot-strip mill – among the three largest in India – which will deliver premium coils ranging from 1.2 to 25.4 mm in thickness. The state-of-the-art hot rolling plant is designed primarily for coil production serving the automotive and durable goods sectors.

Conclusion

This investment will increase steelmaking capacity by around 4 million tonnes per year, transforming the IISCO integrated steel complex into one of the most advanced and sustainable steelworks in India. The expanded product portfolio will be supported by cutting-edge technologies that ensure market competitiveness and the highest safety standards. The initiative underscores SAIL's commitment to reduce carbon footprint and technological excellence, aligning with India's growing steel demand and national sustainability goals.

| Danieli / Primetals Technologies / SMS group

AFRICA – EGYPT

EZDK completes evaluation of shear blades in wire-rod mill

Long-products steelmaker EZDK has successfully completed an extensive performance evaluation of the Danieli shear blades installed at shear No. 7 of its wire-rod mill.

Between July and August 2024, two sets of Danieli blades manufactured with DAN-CUT510 tool steel were used on shears 7/1 and 7/2 of EZDK's wire-rod mill under

full-production conditions. According to the official evaluation, each blade set achieved 45,000 t before the first regrinding, at a wear rate of only 3-4 mm. This allowed multiple regrinding cycles, resulting in a total potential productivity ranging from 135,000 to 225,000 t per set.

The Danieli solution provided a significant lifetime increase, markedly extending maintenance intervals and improving over-

all mill availability. In addition to the enhanced performance, EZDK highlighted the cost advantages of the Danieli blades. Based on the results obtained, the technical managers of the mill recommended sourcing future shear blades directly from Danieli.

| Danieli

AFRICA – TANZANIA

Lodhia Industries to build new bar and wire-rod mill

Lodhia Industries has signed a contract with Danieli for the supply of a new state-of-the-art bar and wire-rod rolling mill complex in Tanzania. A reheating furnace serving the new mill will be supplied by Danieli Centro Combustion India.

The new rolling mill will have an annual production capacity of 300,000 t and will be used to produce rebar in diameters ranging from 8 to 32 mm, while the wire-

rod line will roll smooth wire rod from 5.5 to 8 mm, with coil weights of 2 t and more.

The bar mill will be equipped with 14 cartridge-type stands, a six-pass finishing block, and an in-line quenching and tempering system, complemented by twin-channel high-speed discharge to the cooling bed. The wire-rod line will feature a four-pass finishing block, an in-line cooling system, and Danieli's patented oil-film bearing laying head.

The rolling complex will process 150 mm × 150 mm billets, with provisions for a future upgrade to 165 mm × 165 mm billets. The layout also allows for the future installation of a horizontal billet welder. Commissioning of the new rolling mill is planned for the first half of 2027.

| Danieli

AFRICA – UGANDA

Roofings Rolling Mills started up the new cold-mill complex

The project is contributing to the development of Uganda's steel industry by strengthening the local value chain and enhancing its competitiveness in regional and international markets.

Roofings Rolling Mills Ltd (RRM), one of the largest and most modern steel producers in East and Central Africa, has successfully started up its new cold-mill com-

plex in Uganda, achieving stable operation and consistent product quality.

In 2022, Roofings selected Danieli as the single-source technology partner to design and supply the advanced cold-mill complex, supporting its expansion into the flat products market. The project included a Cold Reversing Mill (CRM), a Hot-Dip Galvanizing Line (HDGL), a Colour Coating Line (CCL), and a Coil-to-Coil Trimming Line (CTC).

With the completion of the CTC line in March 2025, both hot commissioning of the HDGL and CCL have been finalized, marking major milestones in the project. The first galvanized coil was produced in October 2025 while the first colour coated coil on 28 November 2025

| Danieli

THE AMERICAS – USA

Alleima opens service center for high-temperature electrification applications

Alleima's division Kanthal, specialists in industrial heating technology and resistance material, has inaugurated its new service center located in Concord, North Carolina.

Kanthal has expanded its Global[®] silicon carbide heating element manufacturing capacity in Concord to meet the increased

demand by producers of electronics, glass and steel for new high-temperature heating solutions. The heating elements enable electrification of heating processes of up to 1,625°C and can replace fossil fuel heating solutions. This enables customers to reduce CO₂ emissions in their production and make it more energy-efficient, clean and safe, while improving process control.

In 2022, Kanthal consolidated production from three U.S. locations into one large state-of-the-art manufacturing and distribution center in Concord, North Carolina.

■ *Alleima / Kanthal*

U. S. Steel to restart Gary Tin Mill

U. S. Steel plans to restart the Gary Tin Mill at the company's Gary Works facility, positioning the company to increase domestic tin mill production.

U.S. Steel expects the restart of the Gary Tin Mill to occur in early 2027, subject to completion of maintenance activities, procurement of materials, and workforce

readiness. The company is taking a deliberate approach to ensure the Gary Tin Mill can operate safely and reliably once production resumes.

The timing is intended to position the facility to support customer needs aligned with the annual contracting cycle for tin mill products. The planned restart requires sustained customer interest in securing

long-term domestic tin mill supply and U.S. Steel's belief that demand can be met by increased U.S. production when market conditions allow for fair competition.

■ *U. S. Steel*

Cleveland-Cliffs partners with Palantir to deploy AI platform

Cleveland-Cliffs has entered a strategic partnership with Palantir Technologies to deploy advanced AI-driven solutions across its footprint.

The recently executed three-year agreement puts Palantir's AI technology at the

center of Cliffs' key internal processes in operations and commercial. Cliffs is embedding artificial intelligence directly into production planning, order entry, and operational workflows to better integrate data, anticipate constraints, and coordinate activities across its facilities in real

time. The partnership with Palantir reflects Cleveland-Cliffs' broader focus on deploying advanced technology to drive productivity and improve performance.

■ *Cleveland-Cliffs*

Nutec acquires ETS Schaefer

Nutec, manufacturer of high-performance industrial insulation and fire protection products, has acquired ETS Schaefer, which will now operate under the name Nutec ETS Schaefer as a wholly owned subsidiary of Nutec.

Nutec Inc of Huntersville, NC, will focus on leveraging synergies between the two organizations, including expanded commercial coverage, enhanced engineering capabilities, and deeper fiber integration. ETS Schaefer of Macedonia (near Cleveland), OH, specializes in the design and

application of monolithic ceramic fiber linings serving both heavy-industry end users and OEMs whose demanding applications benefit greatly from monolithic fiber insulation solutions.

■ *Nutec*

THE AMERICAS – USA

Pomini Tenova and Ingersoll Machine Tools enter strategic partnership

Pomini Tenova, specialists in roll shop equipment and services, and Ingersoll Machine Tools, a company of the Italian Camozzi Group, have recently signed a strategic partnership agreement, aimed at strengthening the technical support and modernization services available to the metals industry across North America.

The agreement merges Pomini Tenova's expertise as Original Equipment Manufacturer (OEM), encompassing equipment, engineering, and digital solutions, with Ingersoll's notable industrial footprint and advanced manufacturing capabilities across USA, Canada, and Mexico.

Under this agreement, Pomini Tenova will provide the core technological "brain" of the projects, including specialized engineering know-how, state-of-the-art auto-

mation, and HMI software. Furthermore, it will supply internationally patented measuring devices, inspection systems, surface quality control and certification, and advanced Industry 5.0 diagnostic solutions for machine monitoring. Ingersoll Machine Tools will act as the regional manufacturing hub. Thanks to its large facility in Rockford, Illinois, Ingersoll will provide heavy-duty, high-precision machining, capable of meeting any machining task related to roll shop equipment revamping by size and accuracy. The range of its capabilities includes stress relieving, sandblasting, and painting, as well as reverse engineering, which is necessary when original design details are not available.

■ *Pomini Tenova / Ingersoll Machine Tools*



Paolo Gaboardi, Executive Vice President of Pomini Tenova (left) and Jeff Kimberly, President and CEO of Ingersoll Machine Tools, after signing the strategic alliance (Picture: Tenova)

Pacific Steel Group places order for cooling equipment

Pacific Steel Group has placed Systems Spray-Cooled™ LLC an order for the design and supply of spray-cooling equipment for their new EAF project located in Mojave, CA.

The new steel plant built by Pacific Steel Group will include an endless charging system for the 40-t AC EAF. The EAF will utilize spray-cooling for the upper shell and the cantilever style roof. As part of the scope, Systems Spray-Cooled™ will provide engineering for the furnace supply and return water piping.

PSG's decision to install Spray-Cooled™ equipment was based on the need for a reliable and energy efficient solution when considering long term maintenance and operational costs.



The new EAF steel plant built by Pacific Steel Group in Mojave, California (Photo: PSG)

■ *Systems Spray-Cooled™*

THE AMERICAS – USA

The Systems Group to launch refractory maintenance services in steel mills

The Systems Group has announced the official launch of a new business unit, Systems Refractory Solutions, a specialized provider of refractory maintenance services dedicated to the steel industry.

The company will deliver high-quality, safety-focused refractory maintenance solutions designed to enhance reliability, extend equipment life, and reduce downtime at steel mills across the United States. Led by Josh Smitsky, with over 20

years in the refractory industry, and Mike Williams, with over 30 years in steel mill melt shops.

By concentrating exclusively on refractory maintenance, the company aims to solve the unique high-temperature wear challenges faced by melt shops, furnaces, ladles, tunnel & reheat furnaces and other critical components in steel production facilities.

The launch of Systems Refractory Solutions reflects an increasing demand within

the metals industry for dedicated refractory expertise – an area that is critical to the uninterrupted operation of steelmaking infrastructure. With experience in steel mill services and engineered solutions, Systems Refractory Solutions intends to become a trusted partner to operations seeking maximum uptime and cost-effective refractory lifecycle management.

■ *The Systems Group*

U. S. Steel to build DRI facility at the Arkansas site

United States Steel Corporation is investing in a direct reduced iron (DRI) facility at Big River Steel Works in Osceola, Arkansas.

The new facility will leverage U. S. Steel's 2022 investment into direct reduced-

grade pellet capabilities at its Minnesota Ore Operations Keetac plant, creating a direct link between mining operations, EAF feedstock creation, and steel production at Big River Steel Works.

By sitting DRI production at Big River Steel Works, where the Big River 2 expan-

sion is now in full production with four electric arc furnaces, this investment will eliminate the need to ship DRI to the facility.

■ *U. S. Steel*

ASIA – BANGLADESH

Abul Khair Steel to build new wire-rod line

Abul Khair Steel has contracted Danieli to build a new wire-rod line and modernize the existing rebar mill at Chittagong in Bangladesh.

Danieli's scope of supply covers the design and installation of a wire-rod line,

integration of automation systems with process controls, as well as the revamping of the existing rolling mill configuration and finishing facilities. The new line will produce a wide range of low-alloy and special steel grades, covering a range of wire-rod products from 4.5 mm up to 25 mm diam-

eters, with a maximum steady rolling speed of 110 m/s. The project is scheduled to be completed before the end of 2026.

■ *Danieli*

ASIA – CHINA

Baosteel EAF exceeds performance target

Baosteel's new EAF meltshop in Shanghai, supplied by Danieli, has achieved the specified target in January 2026 with a monthly output exceeding 100,000 t.

The new Fastarc Zerobucket EAF was supplied by Danieli in 2023, recently

achieving the impressive target of 31 heats per day. Close cooperation between the Baosteel and Danieli teams enabled continuous improvement of operational parameters. Following the installation phase, the furnace's operation and production performance was progressively opti-

mized with a charge mix based on scrap (from 60 – 100%) and hot metal (from 0 to 40%). Energy consumption was significantly reduced while daily and weekly production targets were steadily achieved.

■ *Danieli*

ASIA – CHINA

Cremer Erzkontor establishes new joint venture

Cremer Erzkontor has opened a new joint venture: Cremer (Yingkou) Supply Chain Co., strategically positioned in the Bayuquan port area near key industrial centres.

With this new venture, Cremer Erzkontor is further expanding its international presence

and strengthening its position as an independent service provider for raw material logistics and quality assurance. Occupying around 7,700 m², the facility provides a full range of services throughout the supply chain, including storage, handling, sampling, analysis, documentation, and loading supervision. The infrastructure comprises sheltered storage

sections right inside the port area, streamlined systems for loading and unloading, as well as a fully equipped laboratory. X-ray fluorescence (XRF) along with conventional wet chemical techniques are employed there to guarantee precise and reliable analyses.

■ *Cremer Erzkontor*

ASIA – INDIA

AM/NS India inaugurates automotive steel production line

ArcelorMittal Nippon Steel India has inaugurated the new pickling line and tandem cold mill (PLTCM) at its Hazira, Gujarat plant.

The 2 million t/year pickling line and tandem cold mill is a key addition to AM/NS India's automotive manufacturing capabilities. It

will soon be configured to produce high-quality, cold-rolled base steel, which will be used to manufacture world-class products, including patented steel solutions from parent companies ArcelorMittal and Nippon Steel. The new facility is designed to support the manufacturing of advanced automotive steel for advanced high

strength steel, galvanized, galvanized, and press hardened steel applications. The dedicated automotive line will strengthen AM/NS India's downstream capabilities, supporting the production of AHSS with strength levels of up to 1,180 MPa.

■ *ArcelorMittal Nippon Steel India*

AM/NS India to build greenfield steel plant in Andhra Pradesh

The foundation stone has been laid for the new 8.2 million t/year integrated steel plant to be built by ArcelorMittal Nippon Steel India (AM/NS India) at Rajayyapeta, Andhra Pradesh.

The Rajayyapeta plant will produce a range of high-quality, value-added steel products, strengthening India's ambition to

expand domestic steelmaking capacity. It boasts an excellent coastal location and proximity to the existing slurry pipe-line that enables easy connection to one of India's richest iron-ore deposits. The project forms part of ArcelorMittal's strategy to expand its presence in India, a key market with strong long-term demand driven by infrastructure, urbanisation and industrial development. It

builds on the expansion already underway at AM/NS India's existing plant in Hazira. The steel manufacturing operations of the new plant are planned to commence by the first quarter of 2029, with other units being introduced in a phased manner over the subsequent quarters.

■ *ArcelorMittal Nippon Steel India*

Jairaj Group achieves record casting and rolling sequence

Jairaj Group reports record performance results of its MIDA QLP mill supplied by Danieli. A major milestone was reached in January 2026, when the plant successfully completed a 27-hour, uninterrupted casting and rolling sequence.

The plant configuration at Jairaj includes a blast furnace in the melting area, with

Danieli having supplied the ladle furnace as well as the casting and rolling technology, featuring direct rolling and a bundling finishing facility. During the 27-hour casting and rolling sequence, a billet of 10,206 m length was produced with a single tundish and 33 heats, at a maximum casting speed of 7.2 m/min – exceeding the original design performances.

The MIDA line at Kurnool is designed for a yearly capacity of 350,000 t of rebar in bundles, covering diameters from 8 to 40 mm. Full-stream production started in May 2025, with a learning curve showing steady and consistent improvement in operational stability and productivity.

■ *Danieli*

ASIA – INDIA

JSW Steel orders water treatment plant for hot-strip mill expansion

JSW Steel has signed a contract with Danieli for the design and supply of a water-treatment plant serving the phase-3 expansion of JSW's hot-strip mill at the Dolvi Works, Maharashtra.

The new unit will supply cooling water to the mill, caster and tunnel furnaces of the thin slab casting and rolling operation. The total cooling-water circuit flow rate for the 4.5-million t/year mill will amount to approximately 58,000 m³/h. The treatment plant will feature DanFilters™, Danieli's patented filtration technology. Plant automation has been designed by Danieli Automation. The water-treatment plant is scheduled to start operation by December 2026.

| Danieli



Treatment plant for cooling water (Photo: Danieli)

Tata Steel to implement blast furnace decarbonization technology

Tata Steel has entered into definitive agreements with Paul Wurth, part of SMS group, to proceed with the phased first industrial demonstration of the EASyMelt (electrically-assisted syngas smelter) technology in Tata Steel's blast furnace E in Jamshedpur.

This initiative represents a key milestone in Tata Steel's journey towards achieving net-zero emissions by 2045 and is based on a memorandum of understanding to collaborate on decarbonizing the ironmaking process signed by Tata Steel and SMS in 2023. Following a successful front-end loading study, Tata Steel has now decided to move forward with the project in a phased manner and jointly work towards the implementation and development of the EASyMelt technology.

This technology enables blast furnaces to operate with minimal coke levels by integrating syngas into the reduction process, significantly lowering carbon emissions. Syngas acts as a reducing agent, replacing coke's role in the blast furnace. Top gas recycling is used to produce syngas by reforming hydrocarbon-containing gases, such as coke oven gas. The result-



After signing the agreements: (from left to right) Peter Kinzel, Head of Green Ironmaking, SMS group; Jochen Burg, CEO of SMS group; Akshay Khullar, VP Engineering & Projects, Tata Steel; Paul Tockert, Executive Vice President CoE Metallurgy, SMS group; and Kanchinadham Parvatheesam, Tata Steel Company Secretary & Chief Legal Officer (Photo: SMS group)

ing syngas is then injected at the shaft and the tuyere levels. Plasma torches directly electrify the process by superheating the syngas injected into the tuyere.

This process is flexible in terms of energy sources and can use natural gas, coke oven gas, hydrogen, ammonia, and electricity. Therefore, it can be adapted to local availability levels and requirements. Fur-

thermore, EASyMelt can still use conventional sinter feed, avoiding dependence on the costly and scarce high-grade iron ore required by direct reduction plants. Upon completion, Tata Steel's blast furnace E in Jamshedpur will be the first plant worldwide to be converted to EASyMelt.

| SMS group

ASIA – INDIA

RPCL Bengaluru places order for compact pellet plant

Resources Pellets Concentrates Pvt. Ltd. (RPCL) Bengaluru has signed a contract with SMS group for the delivery of a compact-sized pellet plant. The new facility will be located in Sandur Taluk, Ballari District, Karnataka.

RPCL Bengaluru is a joint venture between the Indian companies BKG Mining and Fomento Resources. With this project, RPCL is reinforcing its commitment to building a stable resource base and promoting long-term, sustainable development in the regions where its minerals are extracted. As part of the agreement, SMS

will provide the basic engineering, manufacture, and supply of all major plant equipment, along with a comprehensive spare parts package and an integrated digital solution suite. The scheduled timeline for full project delivery is 15 months.

■ *SMS group*

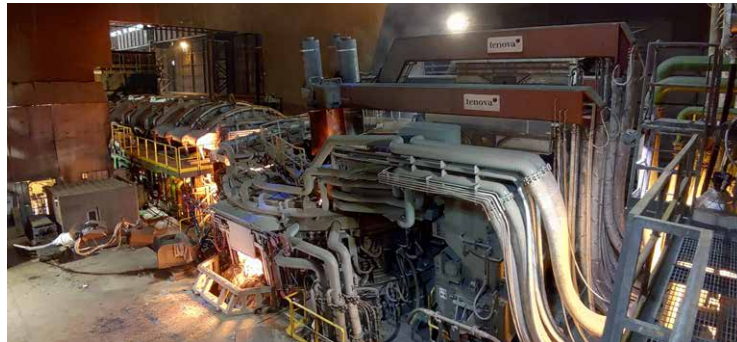
ASIA – JAPAN

Nippon Steel to build electric arc furnace

Nippon Steel Corporation has selected Tenova to supply a Consteel® electric arc furnace for its Yawata works in Kyushu. For this project, Tenova has teamed up with GE Vernova, whose direct feed system will power the EAF.

Once installed, the new furnace will have a heat size of 340 t. The resulting high power level will enable the use of high percentages of virgin iron units, which are essential for producing high-quality steel grades. GE Vernova will supply its direct feed power system, providing the high-stability power needed for this advanced installation.

The Yawata project is a landmark investment that combines innovation and



Electric arc furnace in operation (Photo: Tenova)

sustainability and represents a crucial step in Nippon Steel's pathway to carbon neutrality by 2050, shifting from blast furnace to EAF steelmaking.

■ *Tenova / GE Vernova*

ASIA – SOUTH KOREA

POSCO awards contract for low-emission coke oven battery

POSCO E&C has awarded thyssenkrupp Uhde the contract to design and supply a new low-emission, top-charge coke oven battery for the Pohang steelworks.

The project is part of POSCO's broader modernization program for its coke plants. As part of this initiative, the original battery 3A from the 1980s will be shut down and replaced by new, low-emission state-of-

the-art systems. The design will incorporate thyssenkrupp Uhde's proprietary Envi-BAT® technology, ensuring significantly reduced emissions during the coking process. By preventing pressure peaks at the initial stages of the coking process, the system virtually eliminates emissions through oven doors and the battery roof. The contract with Posco also includes engineering and supply of a state-of-the-art

MonoClaus® plant to replace the outdated two-stage Claus units, as well as a new emission-free tar separation plant to modernize the existing facility. The order covers technology provision, engineering, equipment procurement, site supervision services, and commissioning support.

■ *thyssenkrupp Uhde*

ASIA – SAUDI ARABIA

Hadeed sets new, high-carbon production record

With the support of Danieli Service, Saudi Iron and Steel Company (Hadeed)

achieved new monthly and annual production records at its Jubail works.

The Danieli-supplied EAF and rod mill, commissioned in 2015, are designed for

an annual capacity of 1.1 million t/year and 0.5 million t/year, respectively, producing 150 mm x 150 mm billets in a wide range of special steel grades. October 2025, saw the highest monthly output ever recorded at the plant and, by December

2025, Hadeed set the highest annual record with production amounting to 1,110,081 t/year.

These results were achieved with the support of Danieli Service, which provided advisory services for producing and pro-

cessing high-carbon steel grades at the Danieli continuous casting machine, EAF, and rod mill using.

■ *Danieli*

AUSTRALIA

Alter Steel advances Pinkenba steel mill toward Final Investment Decision

Alter Steel has executed an expanded scope of work with global engineering firm Hatch to finalise development of its proposed Pinkenba steel mill in Queensland, marking a clear step toward a Final Investment Decision (FID).

With established offtake, secured supply partners and detailed engineering underway, the project is progressing through its

final development milestones and remains on track for construction. Hatch will continue working alongside key technical partners, including steelmaking technology provider Danieli. The Pinkenba steel mill builds on an established reinforcing steel supply chain, with downstream operations already supplying steel across Queensland and nationally.

The project integrates scrap supply, proven steelmaking technology and downstream processing, including a collaboration with Sims Metal, alongside Danieli and related downstream operations through Bestbar and Wire Industries. This creates an integrated pathway from raw material to end-use demand.

■ *Hatch /Danieli*

Barca Metals to build new scrap processing plant

Scrap-processing operator Barca Metals has selected Danieli Centro Recycling to supply a new shredder-based recycling plant for the company's newly developed yard in Razorback, New South Wales.

The core of the installation will be a heavy-duty shredder, powered by a

3,000 kW main motor. Upstream, a pre-shredder will perform safe de-bulking of incoming material, reducing explosive risks, stabilizing feeding, and supporting consistent throughput to the main shredder. Downstream, a complete separation line featuring high-efficiency magnetic stages, cascade air separation, and dedi-

cated non-ferrous recovery equipment will ensure exceptionally clean outputs. The optimized layout and process configuration will maximize scrap value, operational safety and overall plant profitability.

■ *Danieli*

Metal Logic purchases site to deploy modular clean steel smelter

Metal Logic has executed an agreement to acquire approximately 1,000 hectares of tenements in Western Australia's iron ore-rich Pilbara region. The acquisition secures the site for Metal Logic's first industrial-scale deployment of its modular, scalable array smelting technology.

Metal Logic Managing Director Joel Nicholls said, "This agreement marks a critical milestone in our journey from technology development to industrial deployment. We have secured a strategic piece of land in the heart of the Pilbara to build Australia's

first modular clean steel smelting hub. Our focus on thermal efficiency has delivered a smelting process that is simultaneously lower-cost and lower-emission than conventional steelmaking."

The site acquisition follows Metal Logic's September 2025 announcement confirming the strategic location and the commencement of modular smelter unit production. The company's modular smelting units are designed to be shipped to site and deployed progressively, enabling a rapid and capital-efficient ramp to the initial 1 million t/year capacity.

The modular architecture is central to Metal Logic's 'smelting as a service' model. Each unit is manufactured, tested and quality-assured at the production facility in Victoria before deployment, reducing on-site construction risk and enabling scalable rollout across multiple locations. The technology also makes lower-grade iron ores economically viable, as it is not grade dependent.

■ *Metal Logic*

IRONMAKING

New benchmark in energy consumption for DRI production

Record-low natural gas consumption achieved on a consistent basis during continuous operation

Suez Steel in Egypt has achieved a new benchmark in energy efficiency at its Direct Reduction Plant (DRP) based on ENERGIRON Zero-Reformer (ZR) technology. The plant, the first large-scale industrial application of this technology, is operating with high metallization rates while ensuring direct hot feeding to the meltshop.

Through continuous operational optimization and accumulated expertise, Suez Steel has reached natural gas consumption levels slightly below 2.2 Gcal per tonne (8.73 MBTU per tonne) on a consistent basis for several months of continuous operations.

A key contribution to these results is the integration of the captive pellet plant recently commissioned by Suez Steel, allowing the supply of high-quality pellets with optimal reducibility characteristics for stable and efficient operation of the direct reduction plant.

Rafic Daou, Vice Chairman and Chief Executive Officer of Suez Steel, stated: "We are collecting the fruits of our works and our growing expertise in the field of pelletizing and iron making; these results confirm the potential of the company Suez Steel and of Egypt to reach excellency in steel industry."

Zulfikar Uddin, CTO and Deputy General Manager of Suez Steel, declared: "This result has been the achievement of all the team steadily focused in seeking the best performance through relentless commitment on continuous improvement and technology development in constant partnership with our technology partners of ENERGIRON."

Marco Lapasin, Vice President at Danieli Centro Metallics, stated: "We are proud of these results that show the potential of the ENERGIRON process, especially when the management and the team is devoted to production and to investigate the best synergies to push the process closer to its theoretical limit. We praise this approach, and we are glad



Suez Steel has reached natural gas consumption levels slightly below 2.2 Gcal per tonne of DRI produced (Picture: Danieli)

We are collecting the fruits of our works and our growing expertise in the field of pelletizing and iron making.

Rafic Daou, Vice Chairman and Chief Executive Officer of Suez Steel

when we can contribute to the success of such an important partner like Suez Steel."

This result establishes a world benchmark in terms of energy efficiency for gas-based direct reduction and contributes to the advancement of sustainable steelmaking, supporting reduced carbon emissions and improved environmental performance.

The ENERGIRON ZR process, jointly developed by Tenova and Danieli, enables flexible gas reduction of iron ore pellets with high metallization and with compact plant footprint.

About Suez Steel. Suez Steel Company operates a DRI-based integrated minimill

in Suez, Egypt. Here, the direct reduction plant (DRP) started operation in 2009. With an original design capacity of 1.95 million t per year, the DRP ranks among the largest capacity DR plants in the world. That time it was the first new generation plant using the Energiron ZR technology ("Zero Reformer": without external reformer). The DRI produced has 94% metallization and 3.5% carbon content. The hot DRI is directly transported to the meltshop with a HYTEMP® system. Cold DRI is also produced via an external cooler if required.

| Danieli

RESEARCH AND DEVELOPMENT

Hydrogen-based DR ironmaking from low-grade ore

The initial batch of Australian iron ore was processed into direct reduced iron in the rotary kiln at the Hylron site in Namibia. The entire process, including hydrogen generation, is powered by renewable energy.

The first industrial scale pilot test has been successfully completed in Namibia: In an electrically powered hydrogen rotary kiln, 80 tonnes of Australian iron ore were converted climate neutrally into direct reduced iron (DRI). With this, SuSteelAG (SuSteelAG: Sustainable Steel from Australia and Germany) is paving the way for a sustainable value chain linking Australia, Namibia, and Germany – from iron production and refinement to green steel. The SuSteelAG project is developing a hydrogen based direct reduction process that, for the first time, can also utilize lower-grade ores – thereby expanding the resource base available for green steel production.

Challenging resources for direct reduction plants

Until now, climate neutral steel production has only been feasible using premium ores with an iron content of roughly 70 percent. These ores, however, are scarce and expensive worldwide. Moreover, existing processes require the use of a shaft furnace, which in turn demands cost and energy intensive pelletizing of the ore.

In early April 2026, for the first time, untreated Australian iron ore with a comparatively low iron content (approx. 56 percent) was processed into direct reduced iron at industrial scale at the Oshivela site in Namibia, where project partner Hylron Green Technologies operates an innovative hydrogen rotary kiln. The German industrial furnace manufacturer TS Elin GmbH was primarily responsible for designing and constructing the rotary kiln.

For the campaign, 80 tonnes of iron ore supplied by Australian mining and technology company Fortescue – also a partner of SuSteelAG – were available. Prior to the industrial trial, researchers at the German Federal Institute for Materials Research



The Hylron direct reduction plant and solar farm in Oshivela, Namibia (Photo: Hylron)

and Testing (BAM) had extensively studied hydrogen based iron reduction at laboratory scale. They derived the optimal operating parameters for the large scale process. Based on these findings, the direct reduction plant in Oshivela successfully refined the Australian ore into DRI with a throughput of approximately five tonnes per hour – in a climate neutral process.

“We have now reached a scale that is highly relevant for industrial production and demonstrated that hydrogen based direct reduction of lower grade ores can be operated economically. This is an essential step toward accelerating green steel production in Germany and beyond,” says Christian Adam from BAM, who coordinates the international SuSteelAG consortium. “This also means that green steel production need not be constrained by the limited availability of premium ores.”

The next step will be to ship the refined iron from Namibia to Germany. Salzgitter Mannesmann Forschung GmbH will investigate how the refined iron can best be integrated into existing industrial processes in order to eventually produce climate friendly steel for cars and other key products.

RWTH Aachen University (Advanced Mineral Processing Technologies

Research and Teaching Unit - AMR) will investigate how Australian ores with lower iron content can be further optimized for direct reduction.

In addition to the companies already mentioned, the SuSteelAG consortium includes Hylron GmbH, Fraunhofer Institute for Surface Engineering and Thin Films IST, Fraunhofer Institute for Ceramic Technologies and Systems IKTS, Heidelberg Manufacturing Deutschland GmbH, and HANSAPORT.

The international SuSteelAG consortium – led by the German Federal Institute for Materials Research and Testing (German: Bundesanstalt für Materialforschung und -prüfung – BAM) – is funded with approximately EUR4.5 million under the 7th Energy Research Programme of the German Federal Ministry of Research, Technology and Space. The innovative hydrogen rotary kiln operated by Hylron Green Technologies in Namibia was supported by the German Federal Ministry for Economic Affairs and Energy.

■ *Bundesanstalt für Materialforschung und -prüfung (BAM), Berlin, Germany*

PROTECTION OF THE ENVIRONMENT

Technology enabling cyanide removal and emission reduction in the steel industry

Ferr-Tech and Danieli Corus have filed a patent application for a technology that removes gas phase cyanide using FerSol[®], Ferr-Tech's stable ferrate (VI) solution. The technology helps reduce NO_x and CO₂ emissions in the steel industry. The filing follows 3.5 years of development, engineering and extensive testing at a leading European steel producer.

Cyanide is present in coke oven gas and blast furnace gas, which are used as fuel gases in various process installations. Upon combustion, e.g. the hot blast system, cyanide contributes to additional NO_x formation. This directly increases emissions and pressure on the available NO_x allowance and indirectly leads to unnecessarily high fuel costs. In addition, elevated NO_x levels accelerate stress corrosion, which is an unacceptable risk in pressure vessels.

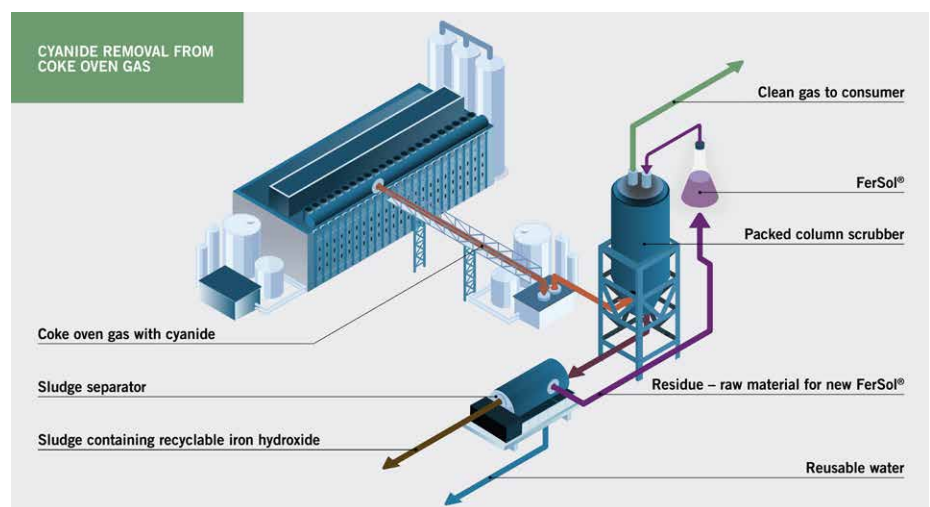
Cyanide removal from fuel gas

During development, Ferr-Tech and Danieli Corus evaluated two routes: treating the fuel gas or treating the flue gas. Since the flue gas stream is much larger in volume and requires more complex installations, the partners selected a treatment that removes cyanide directly from the fuel gas. In this treatment, FerSol[®] is dosed into a packed column and removes cyanide within seconds.

Sina Samimi Sedeh, Head of Innovation at Ferr-Tech: "The testing phase required perseverance, but it provided valuable insights. By refining the design step by step, we arrived at a solution that performs reliably in practice."

More than 99% cyanide removal and a circular residual stream

After laboratory validation, the module was extensively tested in the field. Results show that more than 99% of cyanide components are removed, without the formation of harmful substances. Peter Klut, Manager Technology at Danieli Corus:



Process scheme for cyanide removal from coke oven gas (Picture: Ferr-Tech)

"This powerful, green oxidant breaks down cyanide quickly and completely, without the side reactions seen with traditional chemical oxidants. It prevents corrosion issues and reduces emissions. A promising step forward."

Treatment with FerSol[®] produces clean water, a feed component for the production of new FerSol[®], and an iron hydroxide sludge stream. The sludge contains no cyanide and can be reused as a raw material in the steelmaking process.

Richard Willemsen, Business Development Manager at Danieli Corus, sees this as a major step for the sector: "Steel producers are looking for practical ways to reduce fuel-NO_x, creating room for the additional thermal NO_x that is connected to operating at higher flame temperatures, which lowers overall CO₂ emissions. This technology contributes to achieving these goals while reducing operational costs, because it lowers fuel consumption." This

solution can be integrated relatively easily into existing installations.

Strategic partnership

Ferr-Tech and Danieli Corus have been working together for some time on applications for FerSol[®] in the steel industry. The combination of technology and market know-how accelerates the move toward practical implementation. Richard Bruins, CEO of Ferr-Tech: "The collaboration comes very naturally. We provide FerSol[®] and the technology around it, while Danieli Corus has fundamental knowledge of the steel industry. Together we develop applications that already show tangible results." The partners are currently working with several stakeholders to scale up the technology towards commercial deployment.

■ Ferr-Tech / Danieli Corus

TECHNOLOGICAL INNOVATION MEETS ECONOMIC EFFICIENCY

A new concept in slab mould plate design

Steel producers always try to reduce operational costs, particularly limiting wear of components without compromising process stability or product quality. The newly developed Cu+ slab mould plate concept addresses this challenge through a combination of up to 50% increased lifetime, an optimised cooling approach, and full compatibility with existing caster infrastructure. This enables a new balance between technological performance and cost efficiency in continuous casting operations.

The steel industry is currently facing a challenging market environment. Both German [1] and, more broadly, European steel [2] producers are experiencing stagnating or declining production volumes, a development further intensified by increasing competitive pressure from other markets. Under these conditions, cash cost per unit has become a key performance indicator [3] and can be translated to cost per ton of steel produced for our cases.

Consequently, steel plants are striving to reduce operational expenses wherever possible. This cost pressure extends not only to consumables and process media, but also to high value components with significant replacement costs and short maintenance intervals such as slab mould plates. To address this situation, such components must be improved both technologically and economically.

From a technological perspective, the mould is of central importance, because the solidification that takes place within it has a decisive effect on the internal structure and surface quality of the cast slab [4]. Slab mould plates are subjected to extreme thermal and mechanical load cycles during continuous casting [5, 6]. These cyclic stresses cause surface wear, cracking and coating degradation [5, 7]. To extend the lifetime, plates are periodically refurbished [5]. Typically, slab mould plates offer a machining allowance of around 10 mm, which is incrementally removed during refurbishing to eliminate surface defects.

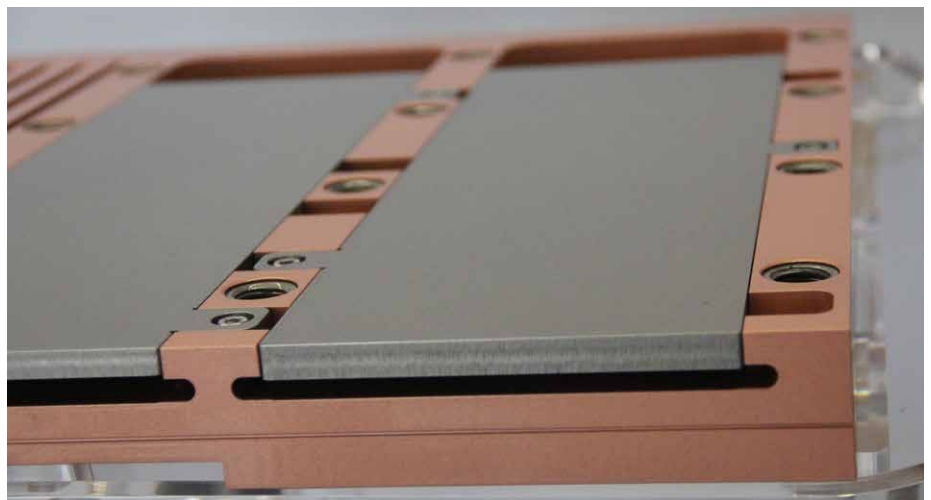


Figure 1. Mould plate with strategically positioned filler pieces (Picture: cunova GmbH)

However, with every re-machining cycle, the overall plate thickness decreases. This geometric change directly affects the heat transfer conditions within the mould, resulting over time in increasingly non-uniform temperature profiles. Ultimately, the number of re-machining cycles is limited, and once the machining allowance is exhausted, the plate must be replaced.

Conventional slab casting mould plates rely on multiple slotted cooling channels that inherently cause non-uniform heat extraction. Compared to thin slab moulds, which benefit from more homogeneous surface cooling concepts, traditional slab mould designs therefore operate at a structural disadvantage when it comes to achieving homogenous thermal conditions.

In response to these technological challenges, the objective of the present development was to design a new slab mould plate that provides clear economic advantages for our customers. The internal development target was to create a plate offering 50% more re-machining allowance compared to standard designs, thereby significantly extending its operational lifetime. At the same time, the new concept had to remain fully compatible with existing caster infrastructure, allowing integration without any modifications to water boxes, mounting interfaces or process control systems.

A further key requirement was to achieve a more homogeneous cooling performance, both in general operation and consistently throughout the entire lifetime

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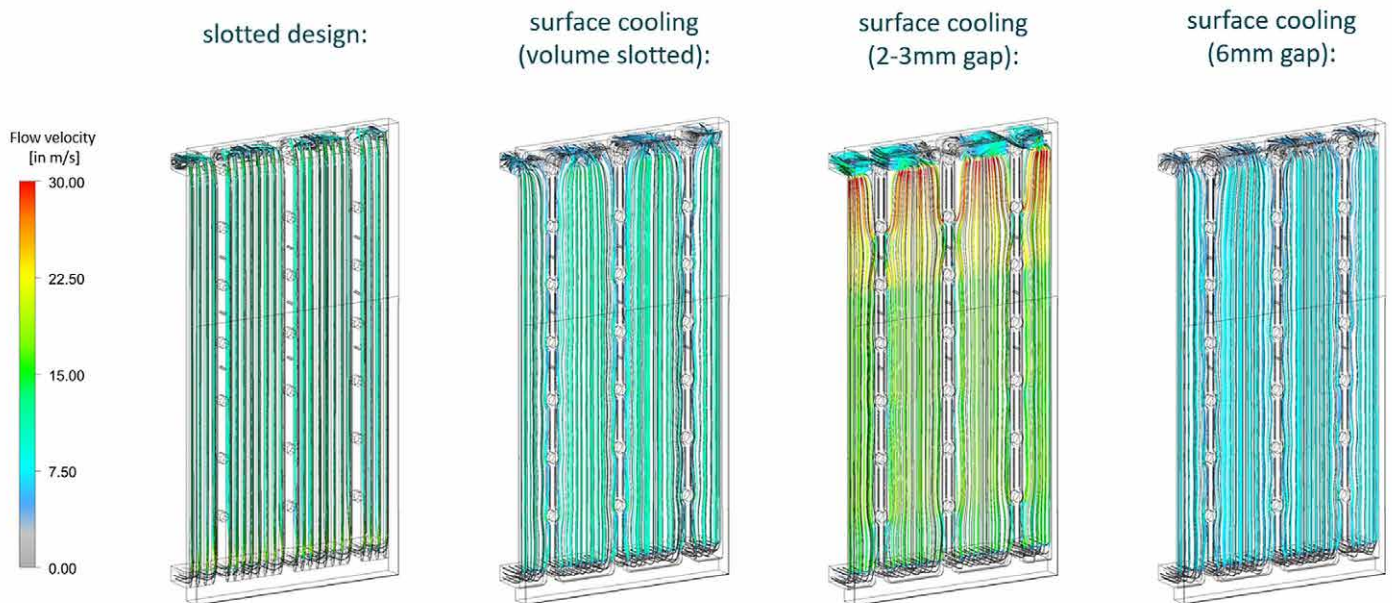


Figure 2. Flow velocities for different water gaps (Picture: cunova GmbH)

of the plate. By maintaining stable thermal conditions independent of the re-machining stage, the aim was to ensure reliable solidification behaviour and improved process stability over time.

This combination of extended lifetime, seamless integration and homogenized thermal performance formed the guiding framework for the Cu+ mould plate development.

Design concept

Two straightforward approaches were initially considered to increase the tons cast per mould plate by extending its operational lifetime: increasing the overall plate thickness to provide additional machining allowance and applying thicker protective coatings to delay surface degradation. Both methods, however, naturally increase the thermal resistance of the plate and therefore require enhanced cooling performance to maintain the necessary heat extraction rates.

To overcome this challenge, the development team drew inspiration from thin slab casting technology [8] and from advanced slab casting plates [9], where advanced cooling concepts via surface cooling are commonly used. This principle was adapted to the slab casting context to improve thermal performance despite thicker copper sections.

A key difficulty in conventional slab mould plates is the variation in cooling

conditions over the plate's lifetime. With each re-machining step, the residual thickness of the plate is reduced. This leads to different cooling conditions at the beginning and at the end of the plate's lifetime, potentially affecting process stability and product quality. To better understand and control these effects, the heat transfer coefficient was analysed using the formulation of [10], which shows that cooling performance is strongly influenced by water temperature, flow velocity and the slot height of the cooling channel.

This insight led to the development of a design strategy in which the depth of the water slot is locally adapted to match the varying plate thickness. Reducing the gap depth at thicker plates increases the water velocity and thereby enhances cooling intensity. The reduced water gap geometry also improves convective heat transfer through an increased Reynolds number. To implement this concept, strategically positioned filler pieces were introduced, creating variable water gaps that allow precise control of local flow and heat dissipation conditions throughout the lifetime of the plate.

The concept was validated through CFD simulations compared with a conventional slotted cooling design. The results show that flow velocities increased from approximately 10 m/s in slotted designs to around 15 m/s with surface cooling (same water volume as slotted design). Thinner water gaps of 2 – 3 mm further increased

velocities up to 30 m/s, whereas a wider 6 mm gap produced around 7.5 m/s. These higher velocities, through the reduced gap, results in significantly lower temperatures in the meniscus region. Simulations demonstrate temperature reductions of up to 50°C compared to the original slotted design, and the use of adapted water channel geometry further reduced temperature differences between the meniscus and lower plate areas. Based on these findings, the simulations indicate the technical feasibility of manufacturing mould plates with 50% greater thickness, enabling a proportional extension of lifetime and tons cast per plate.

Detail design

Building on the validated design concept, the next step was to translate the adaptive cooling approach into a mechanically robust and operationally feasible mould plate design. A central requirement was to ensure that the new Cu+ design remains fully compatible with existing caster infrastructure, including water box interfaces, bolting positions, and thermal control systems. For this reason, the mounting regions and all structural attachment points were kept unchanged, allowing the plates to be installed without any modification to the casting machine.

To realise the variable cooling gap, the rib (slotted) cooling was transformed into a surface cooling area, which serves as

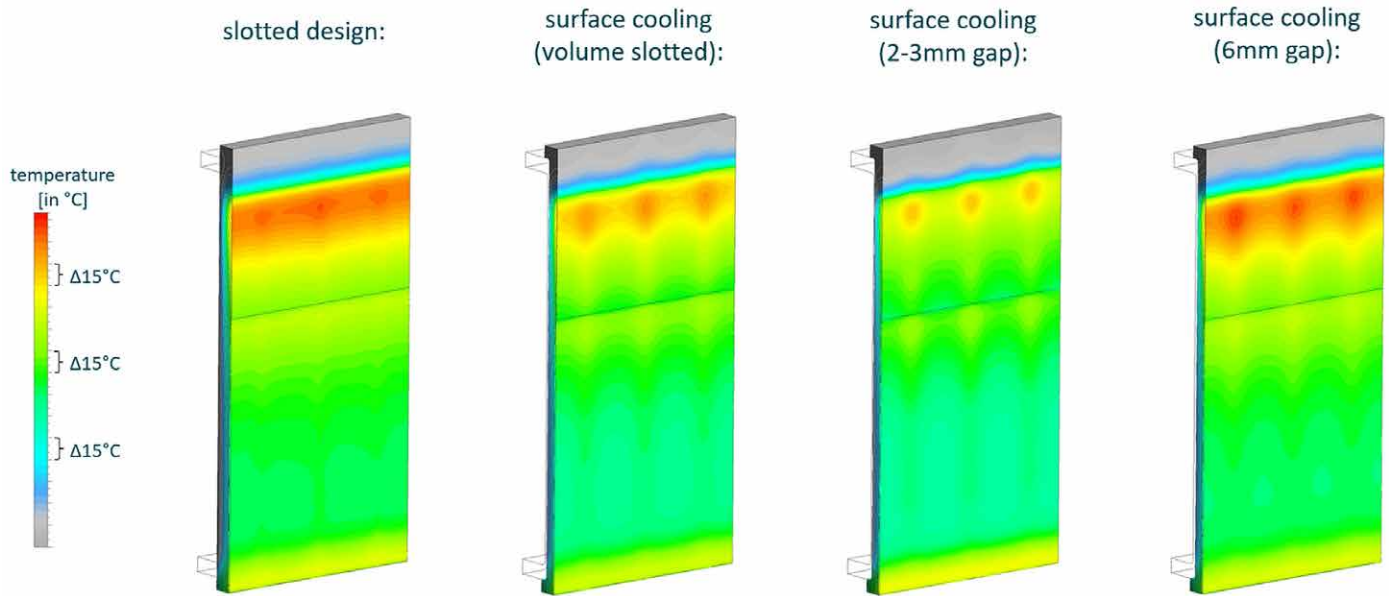


Figure 3. Calculated temperature profiles for different water gaps (Picture: cunova GmbH)

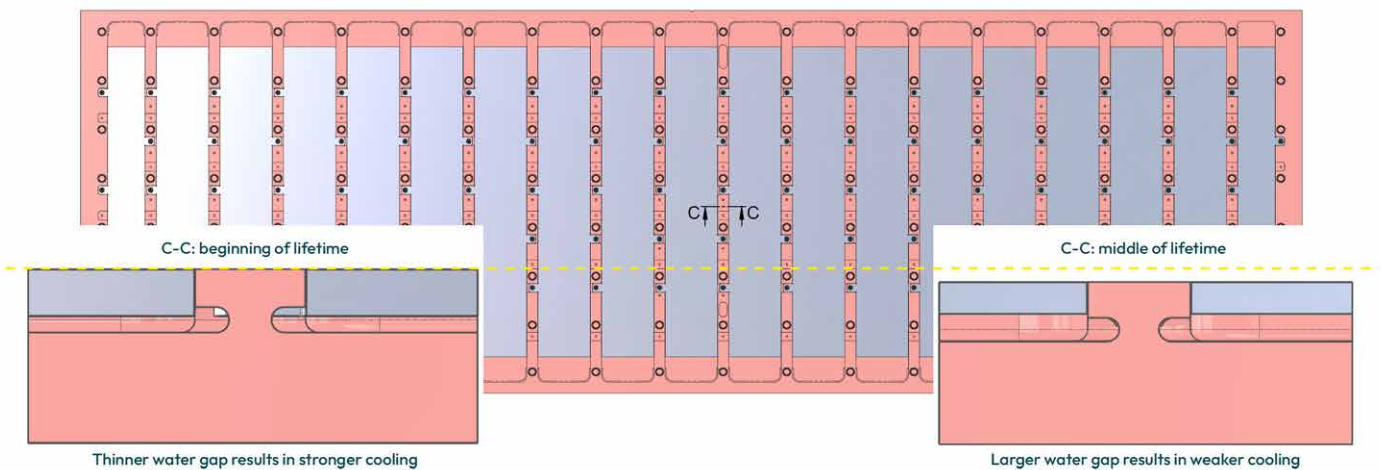


Figure 4. Design of a Cu+ plate (Picture: cunova GmbH)

the interface for interchangeable filler pieces. These filler pieces are manufactured from corrosion resistant, nonmagnetic material, which is identical to that typically used for water box components, to ensure durability under thermal cycling and compatibility with electromagnetic stirring or braking systems. The filler pieces are fixed with standard screws to predefined support points, allowing them to be replaced once during the operational lifetime of the plate as part of the routine re-machining process.

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The goal of this part of the development was to ensure that all temperatures of the Cu+ mould plate remain within the established temperature window of conventional slotted plates across the entire

re-machining range, without requiring any changes to existing measurement or break-out-detection systems. To achieve this, the thermal behaviour of conventional slotted mould plates was analysed in detail across different re-machining stages. These measurements showed a characteristic temperature window of approximately 40°C between the thermal conditions of a new plate and those of a plate with the maximum re-machining depth typically applied in current practice.

The adaptive water gap design of the Cu+ concept was therefore engineered to operate consistently within this established temperature window throughout the entire lifetime of the plate. To accom-

plish this, two optimised water gap configurations were developed: one for the upper re-machining range (new plate) and one for the lower range (half of life time). Both configurations were calibrated so that their resulting temperature distributions closely match the maximum and minimum temperatures of a conventional slotted plate. The resulting curves show that the Cu+ design not only maintains this temperature range across all re-machining states but even reduces the overall temperature spread to around 35°C. This demonstrates that the Cu+ concept achieves more homogeneous thermal behaviour than the existing standard while additionally enabling the 5 mm increase in available machining allowance.

Economic impact

Beyond the technological advances, the Cu+ mould plate concept provides a substantial economic advantage for steel producers. The increase in machining allowance by approximately 50% can be directly translated into a proportional extension of the operational lifetime of each plate. As a result, fewer plates are required per produced ton of steel, which significantly reduces procurement costs and decreases the logistical and administrative efforts associated with stocking, handling, and transport.

To demonstrate the economic effect of the extended lifetime, an illustrative example is shown in **table 1**. In this scenario, the annual production of the caster is 2.4 million tons. Using conventional mould plates with a lifetime of approximately 600,000 tons per set, the caster requires four sets of plates per year. If the purchase price of a standard plate and the Cu+ plate are comparable, the resulting cost per ton is primarily defined by the operational lifetime of the mould plate.

With the Cu+ concept, the lifetime increases by approximately 50% to 900,000 tons per set. Under otherwise identical conditions, the annual demand is reduced from four sets to roughly 2.67 sets per year. Even with a similar purchase price, the cost per ton decreases proportionally, simply because fewer plates are required for the same annual production output.

This example illustrates that the economic benefit of the Cu+ design is not reached from a lower purchase price but

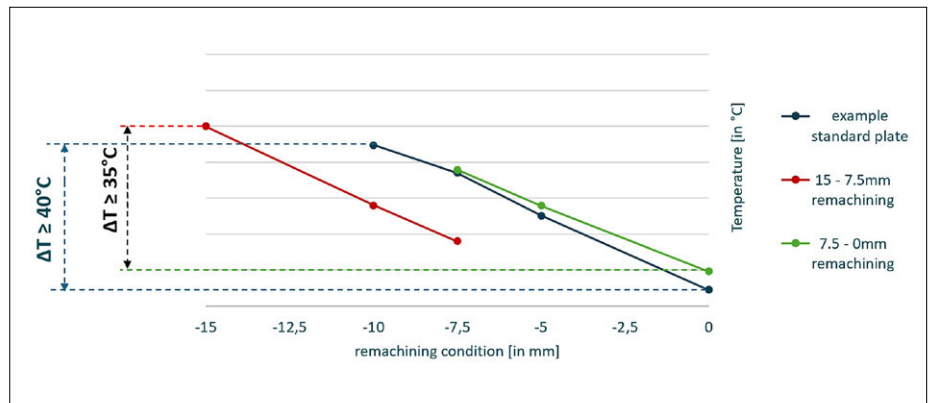


Figure 5. Hot-face temperature for different rework conditions (Picture: cunova GmbH)

Table 1. Example calculation of annual mould-plate demand and cost per ton for an annual production of 2.4 million tons of steel

Annual production		2,400,000	tons
Annual consumption of plates	sets	4	sets
Lifetime	per set	600,000	tons
Price conventional mould	per set	50,000	EUR
	per pc	25,000	EUR
Mould plate cost per tonne		0.083	EUR
Cu+ mould (50% lifetime increase)		900,000	tons
Price Cu+ mould	per set	62,500	EUR
Price Cu+ mould	per pc	31,250	EUR
Mould plate cost per tonne		0.069	EUR
Annual consumption of plates	sets	2.67	sets
Annual cost conventional mould plate		200,000	EUR total
Annual cost Cu+ mould		166,667	EUR total
Annual savings invest in mould plates		33,333	EUR
Annual savings in produce tons		33,333	EUR

from the significantly extended lifetime and the resulting reduction in annual plate consumption. The improved thermal stability and homogenised cooling behaviour add further potential to reduce downstream costs related to conditioning or quality deviations, reinforcing the economic effect beyond the direct reduction in plate usage.

Importantly, all these economic benefits are realised without the need for additional investment in equipment or process adjustments. The Cu+ design is fully compatible with existing water boxes, mould control systems and handling equipment,

meaning no CAPEX is required for integration. The adaptive cooling system, powered by a single replacement of filler pieces during standard maintenance, ensures that improvements in thermal performance and product consistency are achieved with minimal operational effort.

The Cu+ design addresses these issues through two distinct technical mechanisms. First, the transition from slotted cooling to a surface cooling concept inherently promotes a more uniform heat extraction, as planar cooling surfaces distribute thermal loads more evenly than discrete slotted channels. Second, the



Figure 6. The filler pieces create variable water gaps that allow precise control of local flow and heat dissipation conditions
(Picture: cunova GmbH)

adaptive water gap geometry ensures a more consistent temperature field across the entire operational lifetime, avoiding the progressive thermal drift typically observed in conventional plates.

Results and outlook

This development directly addresses the industry's need to reduce maintenance costs and cost-per-ton expenditures without compromising product quality or casting stability. By rethinking conventional mould plate designs, the Cu+ concept combines increased plate thickness with an adaptive, innovative cooling strategy that maintains stable thermal conditions across the full operational lifetime. The additional cooling capacity required for the thicker plate was achieved by replacing the traditional slotted cooling channels with a surface cooling approach, which provides inherently more uniform heat extraction. To keep the cooling performance as constant as possible over the entire re-machining range, two defined water gap geometries are designed. The first gap is used during the initial service period of the plate, while the second gap is introduced after the plate has been partially re-machined (half of lifetime). The corresponding filler pieces are replaced only once during standard re-machining operations, ensur-

ing that the enhanced and more consistent cooling behaviour can be implemented with minimal operational effort.

Having validated the thermal and mechanical behaviour through numerical simulations and detailed design studies, the next phase will focus on transferring the Cu+ concept into industrial practice. Several field trials with selected steel producers have already been agreed upon, and these will provide the first operational data under real casting conditions. Importantly, the technical risk associated with

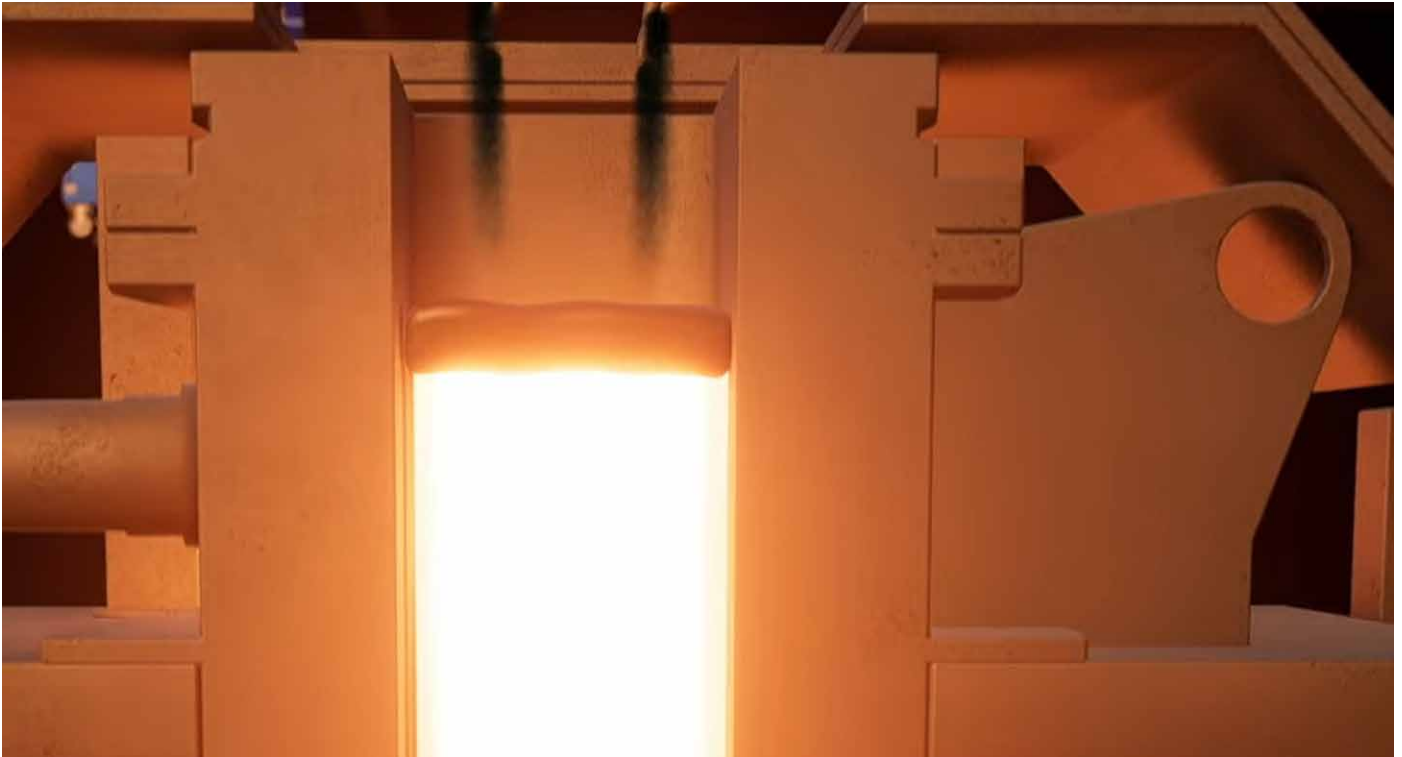
these trials is low, as surface cooling concepts are already well established in conventional slab casters through existing cunova ASM type mould plates.

If additional steel producers are interested in participating in future field trials, cunova would be pleased to discuss potential collaboration opportunities. Any further trials will support a broader evaluation of the Cu+ concept under different operational conditions and contribute to its continued refinement.

■ *cunova GmbH*

References

- [1] Wirtschaftsvereinigung Stahl, "Daten und Fakten zur Stahlindustrie in Deutschland," Sep. 2025.
- [2] EUROFER, "European Steel in Figures," Brussels, 2025. [Online]. Available: www.eurofer.eu
- [3] S&P Global, "Guide to Steel Industry KPIs." Accessed: Feb. 20, 2026. [Online]. Available: <https://www.spglobal.com/market-intelligence/en/news-insights/resources/kpi-guides/steel#request-form>
- [4] K. Schwerdtfeger and A. Diener, *Metallurgie des Stranggiessens: Giessen und Erstarren von Stahl*. Stahleisen, 1992.
- [5] B. G. Thomas, G. Li, A. Moitra, and D. H. Habing, "Analysis of Thermal and Mechanical Behavior of Copper Molds during Continuous Casting of Steel Slabs," *Iron and Steelmaker*, vol. 25, pp. 125–143, 1997, [Online]. Available: <https://api.semanticscholar.org/CorpusID:110426563>
- [6] X. Zhang, "Investigation of Thermal Performance of Mold Copper Plate in Slab Continuous Casting," *The Open Mechanical Engineering Journal*, vol. 5, no. 1, pp. 39–42, Apr. 2011, doi: 10.2174/1874155X01105010039.
- [7] L. Moro, J. Srnec Novak, D. Benasciutti, and F. de Bona, "Copper Mold for Continuous Casting of Steel: Modelling Strategies to Assess Thermal Distortion and Durability," *Key Eng. Mater.*, vol. 754, pp. 287–290, Sep. 2017, doi: 10.4028/www.scientific.net/KEM.754.287.
- [8] cunova GmbH, "cunova Mould Plates." Accessed: Feb. 19, 2026. [Online]. Available: https://cunova.com/fileadmin/user_upload/pdf/Broschueren/cunova_2025/Innovations_MouldPlates.pdf
- [9] cunova GmbH, "ASM Advanced Slab Mould." Accessed: Feb. 19, 2026. [Online]. Available: https://cunova.com/fileadmin/user_upload/pdf/Broschueren/cunova_2025/CastingTechnology_ASM_Advanced_Slab_Mould.pdf
- [10] K. Schwerdtfeger, "Heat Withdrawal in Continuous Casting of Steel." Accessed: Feb. 20, 2026. [Online]. Available: <https://old.foundrygate.com/upload/artigos/g8qZkFvxZXealQJpP3GKrMVaes19.pdf>



Reducing fluorine content in casting fluxes has become a strategic priority for many steelmakers (Picture: Calderys)

CONTINUOUS CASTING

Engineering the next generation of steel casting fluxes

Reducing fluorine content in casting fluxes has become a strategic priority for many steelmakers. Environmental considerations and maintenance-related costs are increasingly encouraging the industry to move toward safer and cleaner formulations. Research teams have therefore been working for several years on one key objective: maintain the full performance of conventional fluxes while significantly reducing fluorine levels.

Casting fluxes are specialized powders added to the mould during the continuous casting process. Their role is to control heat transfer, ensure lubrication, and protect steel quality during solidification, a vital part of the steelmaking process. Casting fluxes rely on a balance between two essential families of raw materials. The first is the melting agent which lowers the melting point of the mixture and ensures that the flux becomes

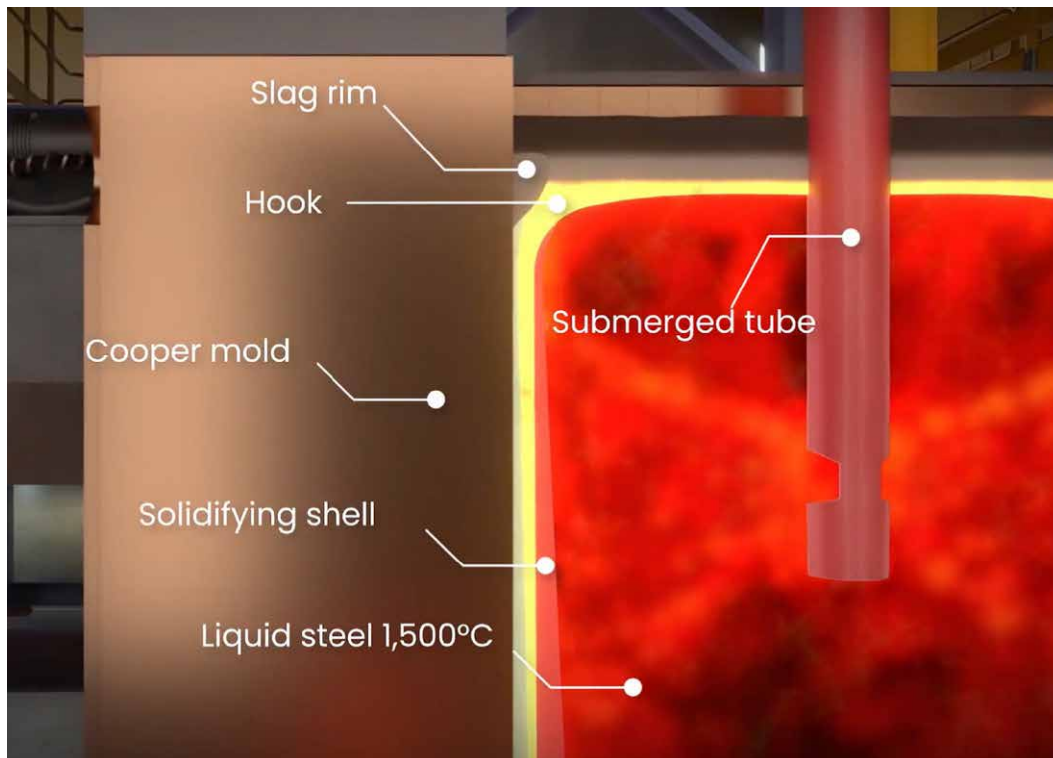
liquid quickly enough to fulfil its lubrication and heat-transfer functions. This group typically includes substances such as fluorides or carbonates. The second family consists of refractory components, which remain solid longer and help regulate crystallization, viscosity, and thermal insulation. The interaction between these two components determines how the flux behaves in the mould: how it melts, how it flows, and how it supports the formation

of a stable solidification shell. Any change to one family inevitably influences the overall performance of the flux, which is why reformulation requires precise control and extensive technical understanding.

Drivers behind fluorine reduction

Fluorine is a traditional component of steel casting fluxes. It is supplied through Calcium fluoride (CaF_2) which lowers the melting

Carole Monchaux, Technical and Quality Manager at Calderys – Contact: info@calderys.com



Steel casting fluxes have a crucial role in the steel casting process
(Picture: Calderys)

point of the flux and contributes to achieving the desired fluidity. However, CaF_2 also introduces several disadvantages:

- › formation of precipitates that can clog the water-spray nozzles responsible for cooling steel during the casting process,
- › accelerated wear of refractory linings inside nozzles due to fluorine's aggressiveness,
- › fluorine contamination in downstream process water.

These impacts have led manufacturers to offer lower-fluorine alternatives.

The technical challenge of preserving performance

Reducing fluorine necessarily involves reducing CaF_2 , which affects melting behaviour, viscosity, basicity, crystallization kinetics, and ultimately the surface quality of slabs, blooms, or billets. A major challenge lies in achieving these adjustments without altering the viscosity or basicity index, both critical parameters for stable casting behaviour.

In Calderys' laboratories, the fluorine content was successfully reduced while maintaining comparable high-temperature

viscosity and basicity values. This required a comprehensive reformulation process supported by a strong understanding of raw materials and their interactions in molten conditions.

Reformulation approach and material selection

To compensate for the reduction in CaF_2 , an alternative agent was employed. Its use requires careful control, as it can lead to lower bulk density for conventional products, with implications for handling, packaging, and transport. Density differences can influence final usage behaviour, and formulations must remain practical for industrial application.

For low-carbon steels in particular, a low-fluor formulation was developed with density values closely aligned with those of standard fluxes, allowing identical application characteristics from the operator's perspective.

Through careful control of viscosity, crystallization behaviour, and thermochemical balance, it is possible to maintain stable heat transfer and lubrication while meeting evolving industrial expectations. The key lies in formulation precision, process understanding, and validation through industrial trials.

A technical collaboration between refractory supplier and steelmaker

A central element of this development was the collaborative relationship between the formulation team and the steelmaker's own research centre. The steelmaker characterized and validated the new formulation through their own laboratories, providing detailed feedback.

This cooperation was supported by frequent discussions and a long-standing trust in the consistent quality of the products delivered in past projects. This environment allowed researchers to explore solutions with high freedom and agility, significantly accelerating the development process.

Industrial testing showed the same performance as conventional products:

- › stable meniscus behaviour,
- › unchanged flux consumption per meter cast,
- › consistent surface quality outcomes.

Steel mills operators have increasingly expressed interest in solutions with reduced impact, and the low-fluor formulations developed within this framework meet these expectations without compromising casting behaviour or productivity.



The formulation of steel casting fluxes depends on the steel grade produced, but also on the industrial processes of the steelmaker (Picture: Calderys)

Scaling innovation across borders

This development effort shows how targeted research and constructive collaboration can advance casting-flux technology. By carefully adjusting the formulation

and validating each step through laboratory and industrial trials with the steelmaker, it became possible to lower fluorine content while maintaining the expected casting behaviour. The project highlights the importance of technical dialogue and

shared objectives, helping the industry move toward safer and more responsible flux solutions without compromising process stability.

■ Calderys

A closer look at the Abbeville site and the wider Calderys network

Located in Abbeville, in the North of France, close to the sea and to its steelmaking customers, the French steel casting fluxes production facility of the Calderys Group has been operating since 1988. The production facility manufactures steel casting fluxes, tailored to the desired steel grades of steelmakers. Products are found in granulate form or powder. The plant serves around seventy customers worldwide. Beyond individual site capabilities, the Calderys Group relies on a global network of production facilities dedicated to steel casting fluxes. Locations including Oberhausen (Germany), Niagara Falls (USA), and Durgapur (India) are equipped to manufacture low-fluorine formulations and contribute to a shared pool of technical expertise. This global footprint enables cross-site knowledge transfer, accelerated formulation optimization, and the consistent deployment of

advanced solutions across regions. By leveraging both local proximity and collective experience, the Group ensures that innovation developed in one location can be efficiently implemented at steel mills worldwide.



The production site of Calderys in Abbeville, France (Picture: Olivier Lattuga-Duyck for Calderys)



The Yukun QSP-DUE® plant incorporates more than 50 Danieli patents (Picture: Danieli)

CONTINUOUS CASTING AND DIRECT HRC PRODUCTION

Two years of operational milestones for Chinese hot strip plant

Casting thickness and full-range endless rolling set new benchmarks with QSP-DUE® technology for continuous casting and direct rolling of hot strip coils

After two years of operation, Chinese steel company Yukun Iron and Steel essentially confirmed the productivity and flexibility achieved with the Danieli QSP-DUE® plant at its site in Yunnan Province, China. The 4.6-million t/year plant started up on April 9, 2024. On that morning the first slab was cast, and by the afternoon the first coil had already been rolled.

The plant features two vertical curved slab casters and a split-mill configuration enabling thermo-mechanical rolling of advanced steel grades, such as low-car-

bon, medium-carbon, medium-carbon HSLA, and weather-resistant, in widths from 900 to 1,500 mm.

As part of plant capability expansion and testing, record-thickness 145-mm slabs were produced using the Danieli-patented DySen caster and rolled directly, demonstrating the process potential. Successful casting sequences of 28 heats in 12 hours on a single caster have also been recorded.

Tunnel furnaces between casting and rolling ensure stable slab temperature and buffer capacity, while an electrical heating sys-

tem between roughing and finishing stands enables endless rolling of ultra-thin strip.

The QSP-DUE® plant covers the full production thickness range of 0.8 to 25.4 mm across all three rolling modes: endless rolling, semi-endless rolling and coil-to-coil. The Yukun QSP-DUE® plant delivers flexibility while retaining the high production capacity of a double strand direct casting and rolling plant. All operations are managed by Danieli Automation process control systems.

| Danieli

ROBOTIC COIL TRIMMING AND SAMPLING SOLUTION FOR WIRE ROD MILLS

The TrimRob autonomous system automates the trimming and sampling of coils in wire rod mill production lines, thereby improving coil management and ensuring consistent product quality. It enhances operator safety by reducing repetitive movements and removing operators from unsafe conditions.

Primetals Technologies has entered into a strategic partnership with Polytec, a global leader in robotic solutions, for the development and commercialization of TrimRob, the first foundry-rated robotic system designed to automate the trimming and sampling process for wire rod mills. The result is a highly accurate, repeatable, and self-contained robotic solution for efficient coil finishing.

Traditional coil trimming is labour-intensive, hazardous, and highly repetitive for operators. TrimRob effectively eliminates these risks by seamlessly integrating into existing production lines, offering an advanced approach to coil management with its ability to handle a wide range of product sizes and grades.



TrimRob autonomous coil trimming and sampling robot (Picture: Primetals Technologies)

Equipped with a state-of-the-art vision system combined with a specialized trimming end-effector, TrimRob automates trimming and sampling tasks with high precision and repeatability – enhancing overall mill productivity. From accurately counting individual coil rings, detecting tangles and overlaps, to executing trimming and sampling without operator intervention, the system enables a reliable alternative to traditional methods.

By removing operators from congested and hazardous areas, wire rod mills can significantly improve safety, reduce maintenance, and achieve consistent product quality while advancing toward higher levels of automation.

■ Primetals Technologies, Ltd. / Polytec S.p.A.

SHAGANG STEEL'S BLAST FURNACE PRODUCES 14,000 TONNES OF HOT METAL PER DAY

A joint team of experts from Shagang Steel and Danieli Corus has successfully ramped up the 5,800 m³ blast furnace No. 4 at Jiangsu Shagang Group's Zhangjiagang integrated iron and steel plant to a record production level

The blast furnace was relined in 2024 by Danieli Corus, converting it from stove cooling to the "Hoogovens" integrated lining and cooling design, which uses machined copper plate coolers combined with high-conductivity graphite refractories. Shagang Steel chose this upgrade to achieve longer campaign lives than the typical seven years associated with stove-cooled furnaces. The "Hoogovens" design, known for campaign lengths of up to 30 years, is the only foreign design adopted in the Chinese steel industry. (The project at Shagang Steel marks the third blast furnace converted by Danieli Corus, following two earlier conversions for the Chinese company Shanxi Taigang.)

After the reline, the blast furnace began its third campaign in June 2024. Production was initially increased to more than 13,000 t of hot metal per day – slightly below the peak levels of earlier campaigns, though achieved with lower coke rates and higher coal injection (PCI) levels.

As part of the reline scope, an operational assistance program was implemented. Through this collaboration, the joint team further increased output and reduced fuel consumption. In December 2025, the blast furnace reached 14,000 t of hot metal (t_{HM}) per day, matching previous record levels set in 2014. At the same time, coke consumption was reduced to below 320 kg/ t_{HM} at times, with PCI rates approaching 200 kg/ t_{HM} – a great improvement over earlier records.

This accomplishment highlights the strong value of combining external expertise with local operational knowledge – bringing global experience to bear on the complex challenge of advancing the per-



As part of the reline scope, an operational assistance program was implemented (Picture: Danieli Corus)

formance of the blast furnace ironmaking process.

■ Danieli Corus

MODERNIZATION

Multiple upgrades for a galvanizing line at Hyundai Steel

Hyundai Steel together with SMS group have successfully completed the modernization of the continuous galvanizing plant and skin pass mill at the Dangjin site in Korea. The comprehensive two-phase modernization included coordinated mechanical and automation upgrades. The result is a more stable and efficient production line that supports Hyundai Steel's ongoing commitment to quality, process consistency, and sustainable operation.

Hyundai Steel has awarded the final acceptance certificate to SMS group for the multi-phase upgrade of the continuous galvanizing line No. 1 (CVGL#1) at its Dangjin plant in Korea. The project strengthened operational efficiency, improved product quality, and secured the long term reliability of the line, enabling Hyundai Steel to meet growing performance demands, particularly in the automotive sector. By modernizing both mechanical and automation systems, SMS group has helped Hyundai Steel significantly improve processing stability while extending the lifetime and capability of the continuous galvanizing line.

The upgrade was executed in two coordinated phases to maintain production continuity. The first phase focused on enhancing downstream equipment following the skin pass mill. New process components such as a strip washer, strip dryer, and optimized bridle roll sets were installed, complemented by new bridle motors and drives. With X Pact® Line Drive Control tailored to the line's requirements, the automation solution delivers precise tension and elongation control, contributing directly to improved strip quality and smoother operation at higher processing speeds.

Skin pass mill renewed

The second phase centered on the technological modernization of the skin pass mill itself. SMS implemented a complete upgrade of the technological control system (TCS) and integrated the latest X Pact® Embedded controller. This phase also included the delivery of the new hydraulic blocks and advanced servo valves for hydraulic gap control (HGC) and work roll bending. Together, these



Modernized hot-dip galvanizing line after phase one, with new bridle rolls and a strip dryer (Picture: SMS group)

improvements ensured accurate strip thickness and flatness control, enhanced tension stability, reduced maintenance requirements, and enhanced overall line stability. SMS's automation team enabled a rapid commissioning with minimal need to adapt the software, reducing any risk to production while accelerating the resumption to normal operation.

Jin-Hyeong Park, Senior Manager of the cold rolling maintenance team at Hyundai Steel, highlighted the importance of the collaboration: "The final acceptance represents another significant step in our long-standing cooperation with SMS group. Their long-term expertise, dating back to the original conversion of our line, has proven valuable once again. The latest modernization further strengthens our pro-

duction capabilities and supports our focus on quality and efficiency."

The successful partnership between Hyundai Steel and SMS began in 2005 with the conversion of the original continuous annealing line into one of the world's first combined continuous annealing and galvanizing lines. Nearly two decades later, the modernized CVGL#1 continues to demonstrate the value of long-term collaboration supported by technical depth and project experience. With the enhanced line now in stable operation, Hyundai Steel is well positioned to meet growing customer demands and maintain the highest operational standards across its galvanized product portfolio.

■ SMS group

MEASURING TECHNOLOGY

High-performance LED micrometer

Thanks to its supreme precision and ease of use, the optoCONTROL 2700 high-performance LED micrometer stands out from the crowd. It is used for inline quality control and machine monitoring, among other things. With a measuring range of 10 or 40 mm, it can be used for a variety of applications, such as roll gap measurement

The optoCONTROL 2700 is a compact high-performance LED micrometer characterized by exceptional precision, a high measuring rate, and ease of use. Two models with measuring ranges of 10 and 40 mm cover a wide range of applications in automation and quality assurance. The active tilt angle correction enables precise detection of objects, even if they are inclined by up to 45°.

Configuration is performed via an intuitive web interface, which makes it possible to set video signals, filters, and various measuring modes. In set-up mode, a shadow image aids with the precise alignment of the target. The system is insensitive to ambient light and is also suitable for harsh ambient conditions and for measur-

ing transparent or reflective objects. Furthermore, the large measuring distance enables flexible integration into various applications.

Roller gap measurement during calendering

The highly accurate LED micrometer is used in quality assurance and machine monitoring. An important measurement task here is the monitoring of the roller gap in calender systems. The gap size is a key factor for controlling and monitoring the production of strip and sheet products. The optoCONTROL 2700 enables precise measurement of micro-gaps of less than 50 µm during the rolling process and thus

ensures high-precision distance control in real time.

Due to the angle measurement, the position of the rollers in relation to each other is detected with absolute precision. This technology ensures constant material accuracy, even in the material width, and helps to avoid material waste. The micrometer is an efficient solution for optimizing rolling processes and ensuring consistently high product quality. The high-performance micrometer will soon also be available with a cable outlet for confined installation spaces. Thanks to the integrated controller, cabling and installation work is reduced to a minimum.

■ *Micro-Epsilon Messtechnik*



The compact high-performance LED micrometer optoCONTROL 2700 (Picture: Micro-Epsilon)

GLOBAL ECONOMIC TRENDS IN THE STEEL INDUSTRY

Forecast for global steel demand

The World Steel Association has released its short-term outlook for global steel demand in 2026 and 2027

Worldsteel forecasts that global demand will grow by 0.3% in 2026 to reach 1,724 million t, followed by an accelerated growth of 2.2% in 2027 to reach 1,762 million t. Commenting on the outlook, Alfonso Hidalgo Calcerrada, Chief Economist, UNESID, and Chair of the worldsteel Economics Committee, said: "Our latest forecasts validate the trajectory established in our October 2025 SRO, confirming that global steel demand is bottoming out over the 2025-2026 period. This follows a protracted and challenging phase of global structural adjustments that has suppressed demand since 2022. We are now transitioning to a path of modest growth in 2026, with a more pronounced acceleration projected for 2027. This broader recovery is being driven by distinct shifts in regional dynamics. In China the rate of demand contraction is finally decelerating in 2026, while demand growth across key developing markets, most notably India, remains vibrant."

However, worldsteel expects the ongoing conflict in the Middle East to result in a sharp drop in that region's steel demand for 2026, which was otherwise positioned for strong growth. Critically, they anticipate a meaningful turnaround in the developed world as a whole. After a protracted period of decline, it is expected to see all major developed economies, including the Euro-

pean Union, the US, Canada, Japan, and Korea, posting positive growth in 2027.

Consequently, global steel demand excluding China is forecast to accelerate to a growth rate of 4.0% in 2027 – a level that has rarely been seen in recent times. While this outlook reflects data available as of mid-March 2026, the escalating conflict in the Middle East presents a significant stress test. The central assumption remains a resolution by June; under this timeline, steel demand in most major economies is expected to remain resilient.

Specifically, the US, China and India appear largely insulated from direct spillovers. Furthermore, despite its high exposure, the EU has bolstered its systemic energy flexibility since the 2022 Russia-Ukraine crisis. The sharp divergence between the gas price peak in 2022 and current price levels illustrates a much more contained impact thus far.

Nevertheless, should hostilities persist beyond the second quarter, material downward revisions will be necessary, particularly for regions with high structural energy sensitivity."

China. Worldsteel expects that the contraction in Chinese steel demand will narrow to -1.5% in 2026, as the housing market correction nears its bottom.

Infrastructure investments in the country are expected to edge up this year, supported by local government efforts to maintain moderately strong GDP growth.

Manufacturing sectors' steel demand may maintain moderate growth as exports continue to expand. However, a tougher global trade environment remains a significant downside risk, potentially slowing steel demand from the manufacturing sector in the coming years.

For 2027, Chinese steel demand is projected to remain essentially flat relative to 2026 levels. This outlook is grounded in the expectation that the protracted real estate sector correction will have largely run its course by 2027, mitigating the severe downward pressure that has dominated the industry since 2021.

As the structural realignment of the property market stabilises, Chinese steel demand may transition into a period of cyclical stability.

In October of last year worldsteel forecast a 2.0% contraction in Chinese steel demand for 2025. The now published official figure for China is a 7.1% contraction. Circumstantial evidence points to a more moderate decline.

Rest of the world. Steel demand growth across developing economies excluding

Country	2025		2026*		2027*	
China	796.0	(-7.1%)	784.1	(- 1.5%)	784.1	(0.0%)
India	159.8	(8.0%)	171.6	(7.4%)	187.4	(9.2%)
United States	90.9	(2.0%)	92.4	(1.7%)	94.3	(2.0%)
Japan	48.0	(-3.4%)	47.9	(-0.1%)	48.7	(1.7%)
South Korea	43.6	(-8.8%)	43.7	(0.3%)	44.2	(1.1%)
Türkiye	39.3	(2.6%)	41.2	(5.0%)	41.2	(0.0%)
Russia	37.6	(-14.0%)	37.2	(-1.0%)	37.6	(1.0%)
Germany	29.2	(10.3%)	30.7	(5.1%)	32.5	(6.0%)
Viet Nam	28.8	(12.0%)	29.4	(2.0%)	29.9	(2.0%)
Brazil	26.8	(2.6%)	27.0	(1.0%)	27.7	(2.5%)

Steel demand of the top 10 steel using countries (Source: worldsteel)

million t; * - forecast

China is projected to moderate to a 2.5% pace in 2026, a significant deceleration from the roughly 5% annual growth recorded in recent years. This cooling is primarily driven by a sharp contraction in the **Middle East**, where regional conflict has abruptly reversed previous growth expectations.

Furthermore, worldsteel anticipates a normalisation of demand across **ASEAN** economies; following a strong expansion in 2025, growth in this region is expected to temporarily soften as stockpiling activity subsides.

However, the outlook for 2027 is more robust, with growth forecast to rebound to 5.1%. This resurgence will be fuelled by sustained momentum in developing Asia and Africa, complemented by an anticipated recovery in the Middle East.

India maintains its position as the world's fastest-growing major steel market, with demand projected to expand by 7.4% in 2026 and accelerate to 9.2% in 2027. This robust outlook is underpinned by broad-based strength across all key steel-consuming sectors. Growth is primarily driven by sustained, infrastructure-led construction and a thriving automotive sector fuelled by increasing freight demand. Furthermore, a resilient capital expenditure cycle continues to bolster demand for capital goods, while nationwide rail network expansion and an affordability-driven surge in consumer durables provide additional structural tailwinds.

As highlighted in worldsteel's previous release, a transformative shift has been underway across **Africa** since 2023, with clear indicators of a robust resurgence in construction activity and domestic steel consumption. The latest forecasts validate

We are now transitioning to a path of modest growth in 2026, with a more pronounced acceleration projected for 2027.

Alfonso Hidalgo Calcerrada, Chair of the worldsteel Economics Committee

this trajectory, projecting a 3.8% growth in 2026 and 4.6% in 2027. This sustained momentum reflects an intensifying focus on large-scale urbanisation, critical infrastructure development and economic diversification efforts, positioning Africa as an increasingly significant and resilient driver of the global steel market.

The **developed world's** steel demand grew by 0.2% in 2025, marking the end to a three-year consecutive decline since 2021. Worldsteel expects this stabilisation to pave the way for a gradual recovery, with growth reaching 1.0% in 2026 and gaining further momentum to 2.3% in 2027. Nevertheless, it is critical to contextualise this recovery within a broader historical frame. The 2025 market size remains roughly 60 million t (15%) lower than the levels seen in 2017–2018, indicating that a full return to pre-crisis volumes is still a long-term endeavour.

The demand in the **EU + UK** region is expected to grow 1.3% in 2026 and 3.0% in 2027. The long-awaited return of steel demand growth in the EU reflects the impact of increased infrastructure and

defence spending in the continent in combination with the expected improvement in macroeconomic conditions such as improvements in real household income. However, the region's high exposure to energy price spikes remains a significant downside risk for 2026.

Steel demand in the **United States** is projected to grow by 1.7% in 2026 and 2.0% in 2027. This expansion is expected to be supported by strong, technology-driven and policy-backed private sector investment, along with continued public infrastructure spending. A healthy recovery is anticipated in the residential construction sector, driven by significant pent-up demand and gradually easing financing conditions. However, the pace of this rebound is likely to remain constrained by persistent structural challenges, including elevated material costs, high mortgage rates, affordability pressures, and ongoing labour shortages. Additionally, demand for durable goods may be tempered amid a softening labour market.

■ worldsteel

GLOBAL DEMAND FOR STEEL WIRE

Steel wire market expands amid industrial growth and infrastructure development

According to a new report from Persistence Market Research, London, the global steel wire market is expected to be valued at around US\$ 122.3 billion in 2026 and projected to reach US\$ 177.9 billion by 2033, growing steadily with a CAGR of 5.5% in the coming years. This expansion comes from rising demand across construction, automotive, and energy sectors, along with advancements in steel processing technologies.

Steel wires play a critical role in reinforcing concrete structures, producing springs and wire ropes, and supporting heavy-duty industrial equipment. Market dynamics show increasing investments in advanced cold-drawing and galvanizing technologies that enhance product durability and performance for demanding applications.

Surge in infrastructure and construction activities

The worldwide surge in infrastructure development significantly boosts demand for steel wire products. Governments and private developers are investing heavily in transportation networks, residential buildings, and industrial facilities to accommodate urbanization and economic expansion. Steel wire is widely used in reinforcement applications such as prestressed concrete, fencing, and suspension cables because of its high tensile strength and reliability. Large-scale infrastructure programs across emerging economies highlight this trend.

Countries such as China and India continue to expand highways, rail systems, and urban infrastructure, creating strong demand for reinforcement materials like steel wire. Construction remains one of the largest consumers of steel wire globally, especially in bridges, tunnels, and high-rise buildings where durability and structural integrity are critical. Industry data shows that global infrastructure investment has accelerated over the past few years, driving consistent growth in demand for steel wire products.

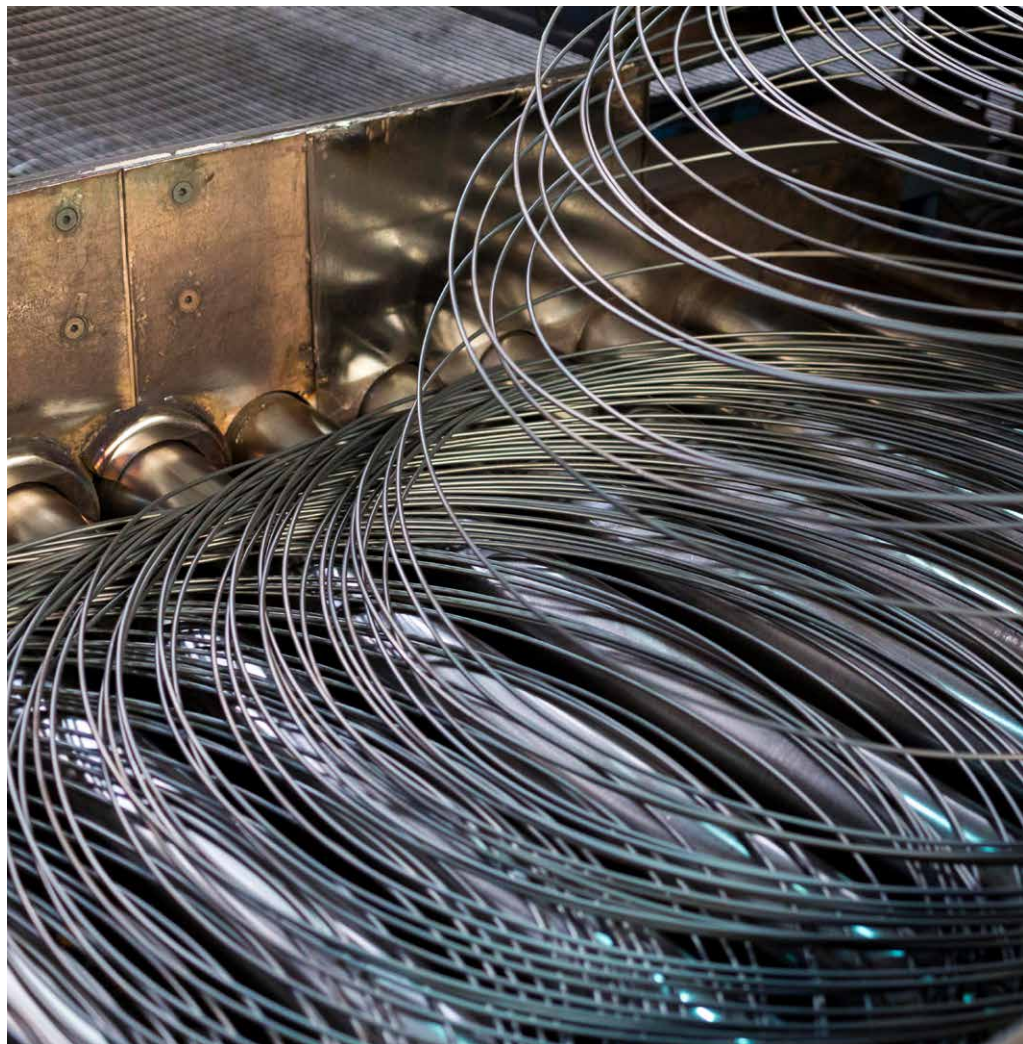
Wire rod produced at Usina Ouru Branco, Brazil (Picture: worldsteel / Gerdau S.A.)

Manufacturers are responding by scaling up production capacity and developing corrosion-resistant and galvanized variants that offer longer service life in challenging environments. Beyond traditional construction, renewable energy projects such as wind farms and power transmission networks rely on steel wire for cables, support structures, and reinforcement.

This expanding use across multiple infrastructure segments ensures long-term growth for the steel wire market.

Expanding automotive and industrial manufacturing demand

Growth in the automotive and industrial manufacturing sectors is another major



driver of the steel wire market. Steel wire is widely used in tire reinforcement cords, suspension springs, fasteners, and various precision mechanical components that require strength and flexibility. Automotive manufacturers rely heavily on high-performance steel wire for structural and safety components. As vehicle production continues to increase in emerging economies, demand for specialized steel wire products also rises. Steel wire plays a key role in tire manufacturing, where it reinforces radial tires to enhance durability and performance.

Industrial machinery manufacturing also contributes significantly to steel wire consumption. Springs, cables, lifting equipment, and conveyor systems often use steel wire due to its durability under mechanical stress. Rapid industrialization in countries across Asia and Southeast Asia has strengthened this demand. Technological innovation further supports market expansion. Manufacturers are investing in advanced wire-drawing processes

and digital quality monitoring systems to improve consistency and mechanical performance. These improvements help meet strict industrial standards and support high-value applications in automotive, aerospace, and heavy machinery sectors.

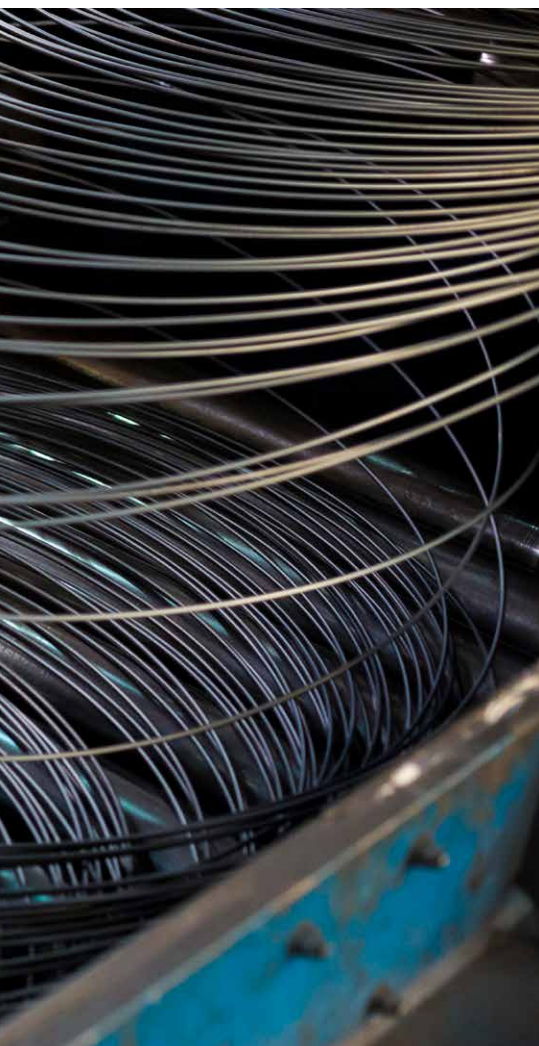
Segmentation insights. Carbon steel wire is projected to dominate the steel wire market, accounting for approximately 39.4% of market share, supported by its extensive use in construction reinforcement, fencing, industrial machinery, and general engineering applications. Its cost efficiency, high tensile strength, and wide availability make it the preferred material for large infrastructure projects such as bridges, highways, and reinforced concrete structures. Major steel producers including ArcelorMittal and Nippon Steel Corporation continue expanding carbon wire rod production to meet rising demand from construction and manufacturing sectors.

Stainless steel wire represents the fastest-growing segment, driven by increasing demand for corrosion-resistant materials in automotive components, medical devices, chemical processing equipment, and marine infrastructure. Manufacturers are also developing high-performance stainless wire solutions for electric vehicles, filtration systems, and precision industrial

applications, reflecting growing adoption in technologically advanced sectors.

Regional insights. Asia Pacific is projected to lead the steel wire market, accounting for approximately 34.5% of market share, and is also the fastest-growing regional market. Rapid industrialization, expanding urban populations, and large-scale infrastructure investments continue to drive strong consumption of steel wire across construction, automotive manufacturing, and industrial production. China remains the largest producer and consumer due to its massive construction sector and extensive manufacturing base, supported by major infrastructure programs such as high-speed rail networks and urban transit systems. India is emerging as another key growth engine, with government initiatives focused on highways, rail modernization, and housing development increasing demand for reinforcement wires and industrial steel products. Continued investment in steel production capacity, wire rod mills, and advanced wire-drawing technologies across the region is expected to strengthen Asia Pacific's leadership in the global steel wire market.

█ *Persistence Market Research, London*



Key highlights of the steel wire market report

- › The global steel wire market is projected to reach US\$ 177.9 billion by 2033, expanding steadily as demand rises across construction, automotive, and industrial sectors.
- › Asia Pacific leads the global market, accounting for around 34.5% share, supported by strong infrastructure development and large-scale manufacturing activity.
- › Carbon steel wire dominates the product segment with about 39.4% market share, widely used in construction reinforcement, fencing, and industrial engineering applications.
- › Stainless steel wire represents the fastest-growing product category, driven by increasing demand in automotive systems, medical devices, chemical processing, and marine infrastructure.
- › Rapid infrastructure development projects across China and India are generating substantial demand for reinforcement wire, cables, and structural steel products.
- › Industry players are increasingly focusing on automation, digital quality monitoring, and high-performance wire products to meet evolving industrial and infrastructure requirements.

A GROWTH ENGINE FOR MEDIUM-VOLUME MARKETS

Modular system of slitting lines for metal service centres

With GEORG precisionflex, GEORG has added to its portfolio a new, modular system of cutting lines specifically tailored to the requirements of small to medium-sized metal service centers. GEORG kicks off the launch of its new series with a slitting line: GEORG precisionslit flex. Starting from a basic line, the equipment can be flexibly upgraded with additional hardware and software modules to meet virtually any future needs.

Service centres with annual production capacities between 40,000 and 100,000 t active in the medium-volume market rely on highly efficient slitting equipment. Not only in the USA is the mar-

ket characterized by businesses that are regionally active with a rather low output volume but a specialist customer base characterized by very exacting demands on the strip quality.

With this in mind, GEORG has developed its modular system of precisionflex cutting lines. These lines are tailored to the needs of small and medium-sized service centres, while achieving the same high quality as GEORG's proven range of high-performance slitting lines. This modular system concept makes it possible for service centres to start with an affordable initial investment and then, by choosing from a wide range of functional packages, gradually augment their output and performance as needed.

The new GEORG precisionflex slitting and cut-to-length lines generally consist of predesigned modules and packages that can be virtually infinitely upgraded by numerous individual applications as demand grows. The first line available to customers is the GEORG precisionslit flex, a slitting line that provides numerous options for future upgrading and extension.

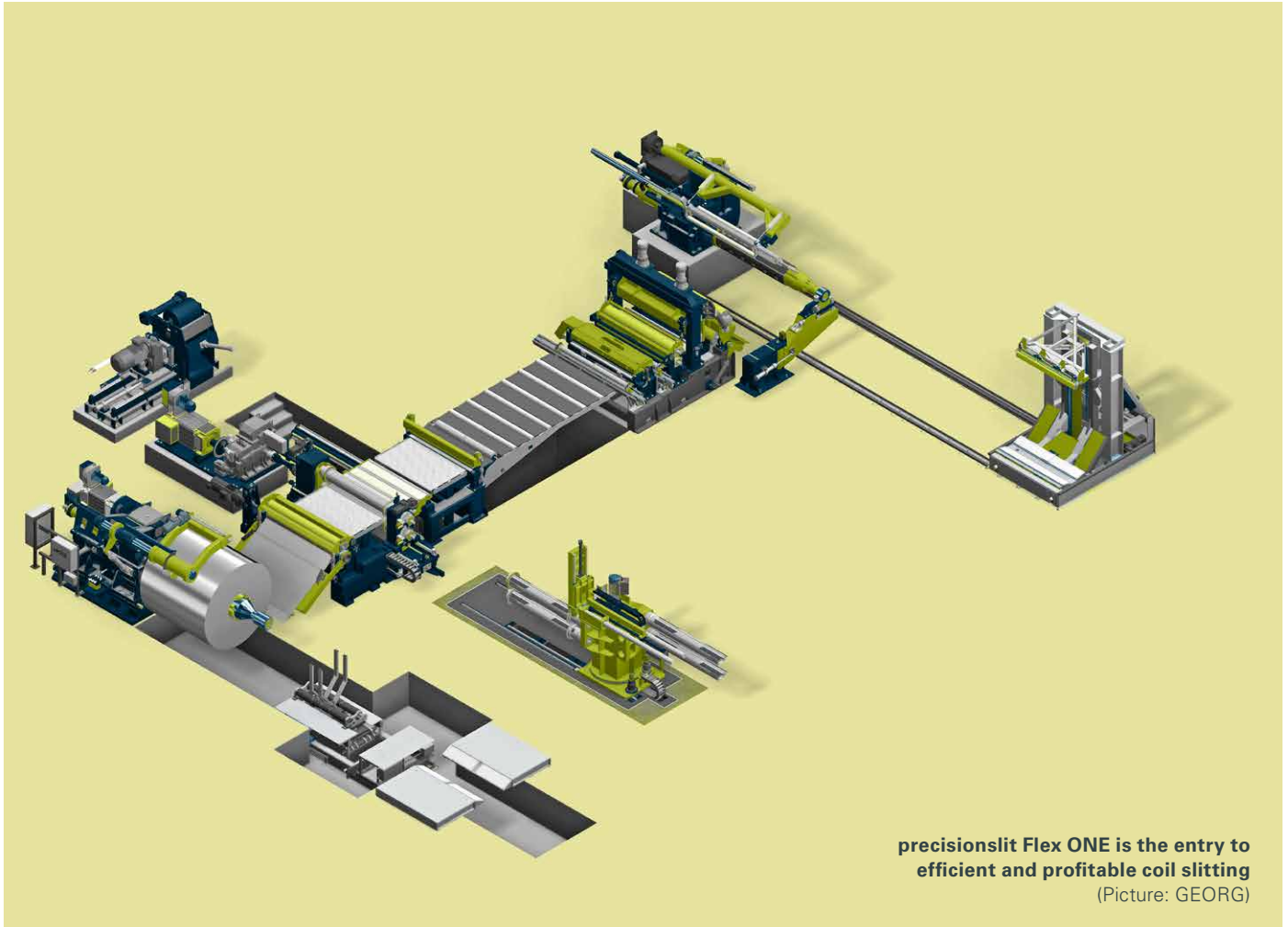
Modular investments

The guiding principle for the engineers designing the new series of systems was to ensure that the new lines achieve the high quality and performance standards GEORG has always been synonymous with. They analyzed the processes in small and medium-sized metal service centres in order to understand what performance features are central to this target group from the very beginning and what could be added at a later stage should the requirements grow. For the operation of slitting lines, key performance features include:



The slit coils produced excel in terms of winding accuracy (Picture: GEORG)

Tom Giebeler, Sales Manager Finishing Lines, Heinrich Georg GmbH Maschinenfabrik – Contact: tom.giebeler@georg.com



precisionslit Flex ONE is the entry to efficient and profitable coil slitting
(Picture: GEORG)

- › excellent cutting accuracy,
- › low-burr cuts,
- › high winding accuracy, also with growing coil diameters on the recoiler,
- › gentle handling of, in particular, delicate surfaces,
- › minimal energy use,
- › low personnel requirement and ease of use.

Based on this, a new line of systems has been developed that combine low investment costs with the proven quality of high-end equipment, while ensuring economical operation, longevity and future-proofness.

Future-proof performance: easy upgrading at any time

The new lines are so designed that, in their initial layout, they meet the customer's current needs. In the basic version, every precisionslit flex line includes

everything needed for the coil slitting process – from the coil car, the slitting shear through to the discharge of the slit coils. A special feature of the lines is that they are prepared for later adaptation to growing requirements by retrofitting specific hardware and software modules. This provides operators the flexibility to adjust the capacity, efficiency and versatility of their lines to changing needs whenever necessary. From the line entry via tool and scrap handling through to the line run-out, every line can be individually configured – and scaled up as requirements grow. All lines are so designed that they can be upgraded with the expansion options available at minimum reconstruction effort and without having to replace the existing components. GEORG offers the system in three versions as following.

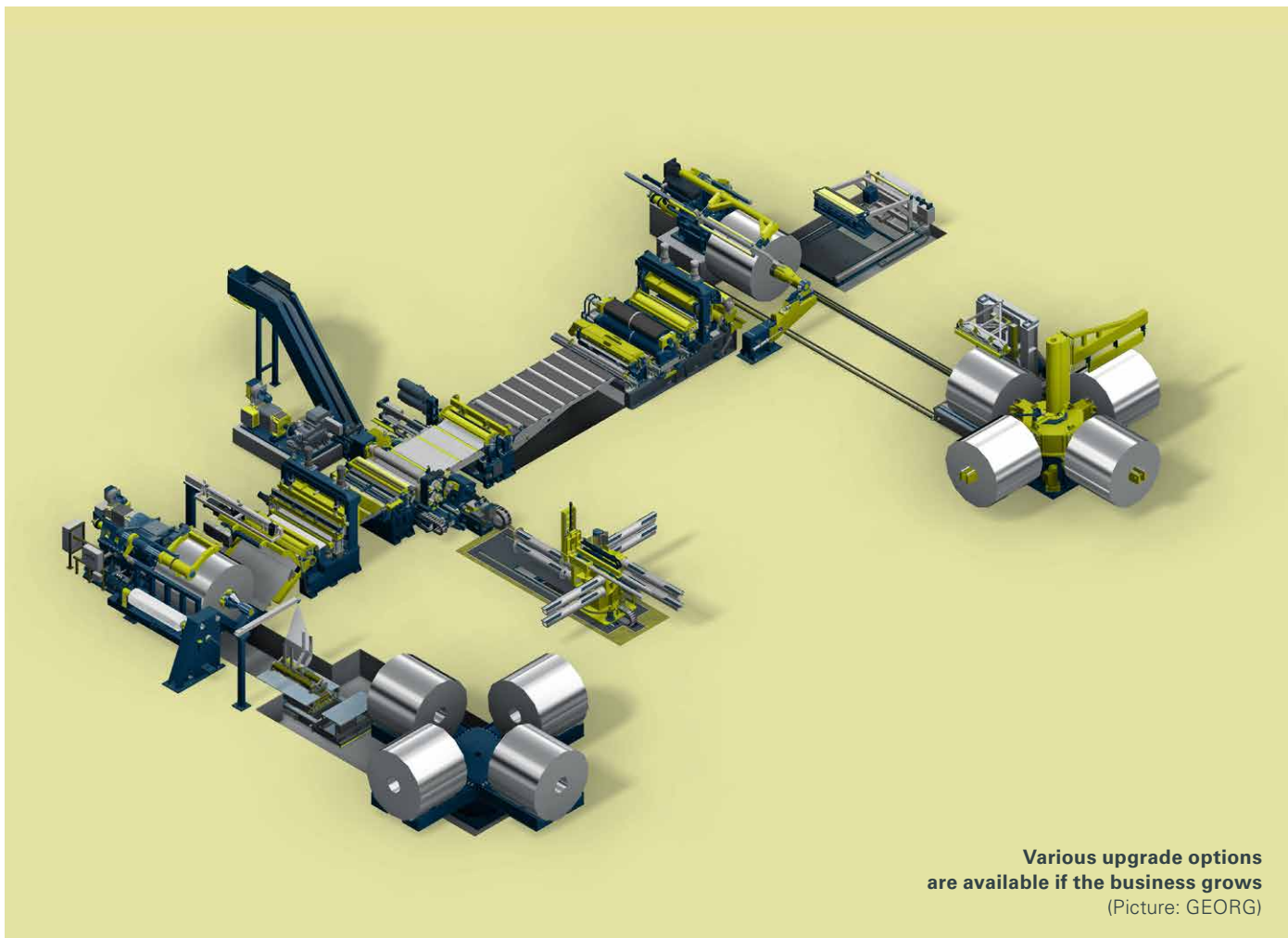
precisionslit flex ONE. This version is designed for small and medium-size service centres whose operations do not

need high line speeds and comprehensive automation, and which are not planning to add thicker-gage coils to their production range in the future.

precisionslit flex Plus. It comes in a design prepared to be upgraded to accommodate higher coil weights, thicker strip gages and higher tensile strengths, for example, and allow for more comprehensive automation of the line.

precisionslit flex Pro. This version has been designed for maximum capacity and line speeds of up to 400 m/min right from the beginning.

Options available include expanded coil handling functions, decoiling from below and a belt-type braking system for the gentle handling of delicate strip surfaces. All three versions of the line can be fitted with the new, automatic GEORG toolingrobot. Moreover, the digital options available for intelligent automation of the slitting pro-



**Various upgrade options
are available if the business grows**
(Picture: GEORG)

cess and smooth integration into the digital landscape of the operator leverage the potential to maximize the productivity of the overall facility.

Increasing productivity with optional upgrading

The lines are designed to process hot-rolled steel (including coated, painted and galvanized), stainless steel and aluminium coils up to 1,880 mm wide and up to 2,300 mm in diameter. In the basic version, the strip is uncoiled from above – a common practice in many operations. Additional options available include multiple-arm turnstiles, various uncoiler designs, measuring systems and crop shears. The slitting line is the beating heart of the overall plant layout. The high-performance lines excel in terms of cutting accuracy – last but not least due to

the high-precision bearings of the tooling assemblies. The minimal deflection of the tooling shaft guarantees both low-burr cuts and long knife life.

In their basic version, the lines are designed for manual tool changing at the capstan. As an alternative, customers can opt for the GEORG toolingrobot. Operators using this robot will see a dramatic decrease in tool change times and thus a critical bottleneck in production disappears. With the toolingrobot, the manual activities associated with tool changing are automated, as well as tasks such as tool cleaning and knife edge inspection. It is specifically tailored to the needs of steel and aluminium service centres, whose operations are characterized by frequent program changes. Therefore, the robot is the logical addition to the slitting lines.

Optional equipment at the line run-out includes roller and belt brakes for the pro-

cessing of delicate-surface strip. It is also possible to retrofit an automatic separator system, which moves each individual separator disk automatically to precisely the required position. This procedure takes only a few seconds and significantly enhances the productivity of the slitting lines.

Like for all their plants, GEORG supplies a fully integrated safety concept for the new precisionslit flex series. This includes the protective barriers and the sensor equipment necessary to supervise the entire plant, protecting the personnel and the process.

The GEORG smartcockpit is a dashboard available to customers to have an overall picture of important process information and for data-driven decision-making – from condition monitoring, automated order management through to remote service. These solutions increase transpar-



The slitting shears produce accurate, low-burr cuts, even when numerous narrow slits need to be made (Picture: GEORG)

ency, minimize set-up times and provide the basis for scalable growth.

Summary

With precisionflex, GEORG has launched a new series of upgradable and future-safe cutting lines that – starting from a basic system – can be flexibly scaled up as the operators' needs grow. For service centres this provides the benefit that they can upgrade their lines anytime, building on their existing equipment modules. Thus, with highly affordable additional investments, they can expand their supply range, develop new markets and maintain a competitive edge in the long run.

■ *Heinrich Georg GmbH Maschinenfabrik*

EUROPEAN STEEL PRODUCTION HITS HISTORIC LOW AS IMPORTS GAIN RECORD MARKET SHARE

According to the latest economic report from the European Steel Association (EUROFER), Europe's steel market is estimated to have shown signs of growth. However, it also highlights how the sector's outlook is clouded by imports having gained a record share of the EU market, falling European production, volatile energy prices and rising trade tensions.

The report highlights that persistently weak demand has forced the European steel industry to reduce production and restructure capacity, with EU crude steel output falling to a historic low of around 125.8 million tonnes in 2025, compared with 130 million tonnes in 2024.

EU apparent steel consumption – steel demand – is estimated to have grown by +2.4% in 2025 and grow by 1.3% in 2026. However, the increase largely reflects a comparison with exceptionally low demand in previous years, rather than a demand-driven recovery. Even with the projected rebound, European steel consumption will remain well below pre-pandemic levels, by around 11 million tonnes in 2026 and 9 million tonnes in 2027. Import pressure on the EU market also

continues to intensify. Steel imports, including semis, rose by +14% in 2025, with finished product imports increasing by +9%, pushing the share of imports in EU steel consumption to a record 29% in the third quarter of 2025. As a result, the EU's steel trade balance deteriorated significantly, with the trade deficit widening to around 2 million tonnes per month, including 1.2 million tonnes of finished products.

War causes volatile energy prices

Energy markets remain another source of uncertainty. Following the outbreak of the war in Iran, volatility has increased and the benchmark TTF gas price exceeded €50/MWh in March 2026, adding further pressure on industrial competitiveness and investment conditions across Europe's manufacturing value chains.

Steel-using sectors

Industrial activity in steel-using sectors has shown tentative signs of improvement. The Steel Weighted Industrial Production (SWIP) index increased by +1.8%

in the third quarter of 2025, after six consecutive quarters of decline. However, the broader outlook remains subdued. SWIP is expected to decline slightly in 2025 (-0.3%) after a sharp contraction in 2024 (-3.6%), before recovering moderately in 2026 (+1.9%) and 2027 (+2.2%). While construction output is beginning to recover, sectors such as automotive and mechanical engineering remain under pressure from weak global demand and trade uncertainty.

Axel Eggert, Director-General of EUROFER, said: "Europe's steel production is shrinking while imports as a share of the EU market are rising. EU policymakers must therefore agree the new steel trade measure quickly without it being weakened otherwise Europe risks losing more industrial capacity. The Iran crisis also shows how exposed European industry remains to global energy shocks. If the EU wants to keep steel production and green investment here, it must deliver both effective trade defence and affordable electricity."

■ *EUROFER*

HIGH THROUGHPUT, LOW ERROR RATES AND COMPACT DESIGN

The Kansas City expansion of Steel and Pipe Supply

For the expansion of their steel service centre in the Midwestern U.S.A., an automatic storage and retrieval system was the ideal solution. Engineered for maximum storage density, the new system makes optimum use of the available space. Automated loading and unloading processes significantly reduce manual labour while accelerating picking and material flow.



The honeycomb automatic storage and retrieval system maximises storage capacity and optimises use of the available footprint (Picture: Kasto Maschinenbau)

When planning a new storage solution for its Kansas City service centre, US-based steel distributor Steel and Pipe Supply (SPS) had a clear vision: safety, high throughput, minimal error rates, and a compact footprint. “We supply the Midwest with bar stock, tubes, and structural sections,” explains John Conley, Co-President at SPS. “Our customers rely on more than just our materials – they count on our outstanding service.”

SPS has a long-standing history dating back to 1933, when Sam Goldstein founded Kansas Hide and Wool during the Great Depression. Originally trading in hides and furs, the business entered the metal scrap and steel market in 1954 after Sam’s passing. By 1959, Jack Goldstein had fully tran-

sitioned into the steel sector and renamed the company Steel and Pipe Supply Co. Today, SPS operates across multiple sites in the Midwest and is among the largest privately held steel service centres in the United States.

The company’s broad product range includes carbon steel such as structural steel, flat steel, and coils. These are supplied to sectors including construction, energy, chemicals, and petrochemicals. SPS also offers a variety of value-added services such as sawing, drilling, flame cutting, bevel cutting, as well as laser and plasma cutting – providing materials tailored to customer specifications. With its own truck fleet, the company ensures prompt and reliable delivery. “We’ve always embraced technology to boost efficiency and support digital solutions,” says Conley. “It’s all part of our commitment to continuous improvement in the steel industry.”

From two to three: expanding capacity and capabilities

SPS had already installed automated storage systems from Kasto at its sites in Tulsa, Oklahoma, and Longview, Texas – both of which have experienced significant performance improvements. “These systems have made our operations faster, more precise, and significantly safer,” Conley explains. “Incorrect deliveries have become a rare occurrence.” Building on

The system doesn’t just improve safety – it makes daily routines easier, faster, and more rewarding for our team.

John Conley, Co-President at Steel and Pipe Supply



Thanks to intelligent circulation stations, infeed and outfeed speeds have significantly increased (Picture: Kasto Maschinenbau)

this success, SPS once again chose the German equipment supplier for its Kansas City project. “We knew we wanted to continue relying on Kasto’s dependable technology,” he adds.

Like many steel stockholders, SPS faces challenges such as limited storage space, safety risks from manual handling of heavy goods, and the need for precise stock management. At its Kansas City site alone, SPS handles around 16,000 tonnes of material. Another factor: due to its location near an airport, the new warehouse had to comply with strict height restrictions.

Automation in action: maximum efficiency, speed, and safety

For SPS, the KASTO UNICOMPACT 5.0 honeycomb automatic storage and retrieval system was the ideal solution for the Kansas City facility. Engineered for maximum storage density, the system makes optimum use of the available space – a key advantage given the height limitations of the site. Automated loading and unloading processes significantly reduce manual labour while accelerating picking and material flow.

Thanks to its “goods-to-person” design, orders are processed quickly and ergonomically – ensuring both high throughput and operator comfort. SPS can now move bar and pipe materials more efficiently, with fewer handling errors and less waste.

Transforming storage

The UNICOMPACT 5.0 is designed to handle long goods of up to 7.3 m (24') in length and 400 mm (16") in height. Its high-density configuration, with thousands of individual honeycomb storage locations, provides far greater storage capacity than conventional racking systems. Automated material handling further improves workplace safety by reducing direct contact with heavy items – significantly lowering the risk of injury.

Faster cassette changes streamline operations, enabling staff to retrieve and stage orders more quickly. “The system doesn’t just improve safety – it makes dai-

ly routines easier, faster, and more rewarding for our team,” says John Conley. “That kind of upgrade makes a real difference to morale and productivity.”

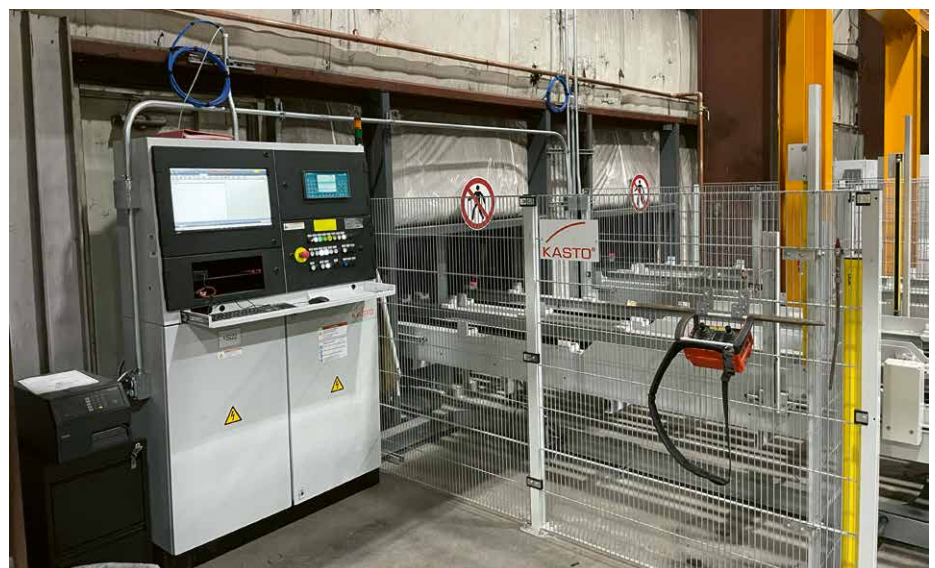
All material movements are monitored in real time via the KASTologic warehouse management system. This intelligent software records inventory data automatically, removing the need for manual entries and greatly reducing the likelihood of errors or misplaced stock. The result: greater transparency, improved accuracy, and measurable savings in personnel costs.

A strategic investment in performance and people

For SPS, the investment in the automated solution aligns perfectly with the company’s long-term strategy of enhancing safety, efficiency, and accuracy through automation. “Safety has always been our top priority,” says Conley. “This system helps us achieve it without compromising on speed or precision. It’s a win-win – for our people and our performance.”

Although the project involved a few logistical challenges – as is often the case with large-scale installations – Conley praised the fast and professional support of Kasto’s US-based service team. “Their support was excellent. Whenever we needed assistance, they were quick to respond and highly competent. That kind of reliability keeps downtime to a minimum and helps us remain agile.”

■ Kasto Maschinenbau GmbH & Co. KG



Perpetual inventory: the technology automatically and digitally track all inventory and material movement (Picture: Kasto Maschinenbau)

THYSSENKRUPP MATERIALS SERVICES ACQUIRES MEXICO-BASED STEEL SERVICE CENTER

thyssenkrupp Materials Services has taken an important step in strengthening its service center footprint in North America with the acquisition of a majority stake in Aceroteca Trading, a flat-rolled carbon steel processing and service center business located in Santa Catarina, Nuevo León, Mexico.

The acquisition gives thyssenkrupp Materials Services a modern, scalable processing platform in one of Mexico's manufacturing hubs. The Santa Catarina service center improves proximity to customers, enables localized processing, shortens lead time, and optimizes supply chain solutions. Aceroteca currently serves industries including heating & cooling and power transmission. It offers substantial available capacity to thyssenkrupp Materials Services for both new and existing customers in the region.

Héctor Morales, founder and CEO of Aceroteca Trading, will continue to lead the busi-



The facilities of Aceroteca Trading located in Santa Catarina within the metropolitan area of Monterrey, Nuevo León, Mexico (Picture: thyssenkrupp Material Services / Aceroteca Trading)

ness and retain a minority ownership stake. While the initial focus remains on flat-rolled carbon steel products, the acquired infrastructure provides optionality for future expansion into additional product categories.

thyssenkrupp Material Services /
Aceroteca Trading

EUROMETAL LAUNCHES CALL TO ACTION

The European Federation of Steel Distributors, Traders and Service Centres (Eurometal), together with national federations and steelmakers, has launched a call to action to safeguard the European steel and metals industry.

The initiative calls on the EU member states and European Commission to act swiftly and decisively to safeguard the European steel and metals value chain. The signatories warn that the European

steel and metals ecosystem is facing increasingly severe pressures, including rising volumes of processed products imports, global trade distortions and protectionist measures by third countries and persistently high energy and regulatory costs in Europe. They underline that effective and immediately applicable trade measures are needed now, aligned with those already implemented by major trading partners such as the United States and Canada. Without swift and coordinated

action, the sector risks significant job losses, increased dependence on third countries, and a weakening of Europe's strategic autonomy. At the same time, they stress that EU climate ambitions must be preserved, but within a framework that ensures global competitiveness and enables European industry to decarbonize without losing ground to unfair competi-

Eurometal

HUZHOU HATEBUR TO UPGRADE FORGING LINE

SMS group has received an order from Huzhou Hatebur Precision Forging to supply an SMS Elotherm bar heating machine for the Huzhou site in Zhejiang Province, China.

Huzhou Hatebur, part of the C&U Group, chose SMS for its technical expertise to

upgrade its facilities to deliver more efficient, robust, and sustainable precision forging. The SMS scope of supply for the ELO-BAR solution includes auxiliary equipment as well as the associated core components, drives, and critical control systems. Electrification of billet heating reduces CO₂ emissions. The machine will

be designed to achieve a maximum throughput of 5.6 t/h. Start-up is scheduled for the end of 2026.

SMS group

ORRCON STEEL MANUFACTURING OPERATES AUTOMATED TUBE MILL

Australian tube maker Orrcon Steel Manufacturing, part of BlueScope, is achieving high performance with its fully automated OTO tube mill from Fives, resulting in increased production of high-quality structural tubes for construction and infrastructure applications.

The OTO tube mill at Orrcon Steel Manufacturing's Unanderra facility is a turnkey solution from Fives, featuring advanced automation at every stage of the process, from coil loading to packaging. Key innovations include a new loading carriage with integrated burr rotation to maximize productivity and enhance operator safety, a fast and reliable shear welder, a high-quality

cut-off, and a robotic packaging system for high performance and flexibility. The line is designed to produce large structural hollow sections of up to 250 mm in diameter, with wall thicknesses of up to 10 mm, and production speeds of up to 80 m/min.

The entire tube manufacturing process is enhanced by a modular digital platform that improves process performance. This platform also enables advanced automation of the robotic packaging system. Preloaded recipes in the automation systems tell the robots to automatically pick and place the tubes according to the pre-configured bundle arrangement.

█ *Fives*



In addition to reducing manual handling, the automated process ensures repeatability, clean and consistent bundle formation, and lower noise levels (Picture: Fives)

PROMETALBAKLI PLACES MAJOR ORDER FOR LOW-CARBON STAINLESS STEEL



PrometalBakli S.A., a leading tinplate and stainless steel service center in Greece, has placed an order for 3,500 t of Outokumpu Circle Green® stainless steel.

Circle Green is certified for its significantly reduced carbon footprint, with CO₂ emissions below 1,000 kg of CO₂ per ton of stainless steel produced (CO₂e). The material combines high recycled content with carefully selected, low-emission

alloying elements and uses 100% low-carbon electricity in key production stages.

This order marks the beginning of a broader supply partnership. Circle Green stainless steel is expected to represent more than one-third of PrometalBakli's annual stainless steel purchases in the future. The company operates tinplate and stainless steel service centers across Greece, Spain, and Poland.

█ *PrometalBakli / Outokumpu*

Nefeli Bakli and Giannis Baklis, representatives of the family business leadership (Picture: PrometalBakli)

WUPPERMANN METALLTECHNIK OPENS NEW TUBE PLANT

Wuppermann Metalltechnik GmbH (WMT) has officially opened its new tube plant at the Altmünster site in Austria, an investment that has significantly expanded WMT's production capacity and product range.

The production range at the new state-of-the-art facility will include complex special sections with wall thicknesses of up to 4 mm and an extended range of dimensions and strengths. Steel grades pro-

cessed will include DP800, DP980 and 22MnB5, with tensile strengths of up to 1,000 MPa. The facility is equipped with fully automated raw material and finished goods warehouses, as well as highly digitized logistics and production processes.

In addition to the new state-of-the-art section line, WMT's existing tube welding line will remain in operation. To increase efficiency, it will be relocated to the new hall complex.

█ *Wuppermann Metalltechnik*



Wuppermann has added a new tube plant to its facilities in Altmünster, Austria (Picture: Wuppermann)

BREAKTHROUGH IN AUTOMOTIVE STEEL DESIGN

Development of ultra-strong low-temperature hot-formed steels with zinc coating

Tata Steel Nederland leads European consortium supporting the research project “Warm Press Formed Zinc Coated Third Generation Advanced High Strength Steels with High Crash and Corrosion Resistance and Minimized Microcracking (WarP-AHSS)”



Dr Radhakanta Rana holding a hot press formed automotive steel component
(Picture: Tata Steel Nederland)

The automotive industry faces a dual challenge: against a backdrop of enormous cost pressure, it must use its resources as efficiently as possible while simultaneously making its vehicles even safer. Ultra-strong steels are used for structural components, for example in crash-relevant parts. Some of these steels, such as boron-containing steels which are used in the B-pillar of the car,

are currently hot-formed at very high temperatures, typically between 900°C and 950°C.

At these temperatures, a zinc coating – which would fundamentally provide best corrosion protection to steel – would liquify, penetrate into steel grain boundaries and cause cracks under forming conditions. Such micro-cracks in the surface would impair fatigue life as well as bend-

ability and ductility. Therefore, both steel producers and automotive manufacturers currently rely primarily on aluminium-silicon coatings for direct hot-forming where the steel is press-quenched directly without any intermediate hold. Yet, while these coatings are heat-resistant, they offer inferior corrosion protection, lead to massive tool wear, and sometimes require additional post-processing steps.

This is precisely where an international research consortium led by Tata Steel Nederland comes into play: as part of a European project called “Warm Press Formed Zinc Coated Third Generation Advanced High Strength Steels with High Crash and Corrosion Resistance and Minimized Microcracking (WarP-AHSS)”, partners from five countries – including Volkswagen Group, RWTH Aachen University, and research institutes from Spain, Sweden, and France – are working on a groundbreaking solution.

Within WarP-AHSS, ultra-strong yet ductile medium-manganese steels are being developed that are reheated at only 700°C to 750°C – up to 250 degrees lower than conventional solutions. Moreover, these medium-manganese steels are significantly more resistant to impurities, making them amenable to the transition to green steel.

Zinc instead of aluminium-silicon: lower temperatures enable better coating

For example, with conventional hot-forming steels such as 22MnB5 grade, a zinc coating cannot be used in direct hot-forming due to the high process temperatures. This

*Dr Radhakanta Rana, metallurgist and project leader WarP-AHSS project at Tata Steel Nederland –
Contact: Radhakanta.Rana@tatasteelurope.com*

is why the automotive industry currently uses aluminium-silicon coatings that can withstand high temperatures. However, there is a high cost: aluminium-silicon coatings form hard, brittle intermetallic phases that lead to significant tool wear: the hard intermetallics from the coating stick to the press tool, accumulate there and contaminate the pressing equipment. This phenomenon is also known as 'galling'.

The results are production interruptions for complex cleaning operations and shortened service life of press tools. In addition, aluminium-silicon coatings offer significantly inferior corrosion protection compared to the cathodic protection of zinc to the steel.

The medium-manganese steels developed in the WarP-AHSS project resolve this dilemma: at forming temperatures in the press of 550°C to 630°C, the zinc coating remains intact. This means that, for the first time in practice, the advantages of a zinc coating – excellent corrosion protection, good weldability and no tooling issues – can be combined with the mechanical properties of ultra-strong hot-forming steels.

Retained austenite ensures superior crash performance

The metallurgical core of the new steels is a sophisticated microstructure. While conventional hot-formed steels consist almost entirely of hard, brittle martensite after cooling, the medium-manganese steels deliberately retain a high proportion of retained austenite alongside ferrite and martensite.

This retained austenite is the key to superior crash performance. Under load, the austenite gradually transforms into martensite, a mechanism known as the TRIP (Transformation-Induced Plasticity) effect. The material continuously strain-hardens during deformation, thereby absorbing enormous amounts of energy.

The new steels achieve strengths of 1200 to 1500 megapascals – in some cases even higher – while simultaneously offering significantly higher ductility than conventional boron steels. They can absorb up to twice as much impact energy as the standard steel grade 22MnB5. In practical terms, this means that a vehicle can achieve the same crash performance in a head-on collision at approximately 40 percent higher speed.

Benefits for automotive manufacturers and the Green Steel strategy

At the same time, lower processing temperatures significantly reduce energy consumption for automotive manufacturers. Unlike the hard aluminium-silicon coating, the soft zinc layer does not cause the galling effect already mentioned. This reduces tool maintenance and cleaning intervals while extending press service life. In addition, post-processing steps such as sand-blasting are eliminated due to lower oxidation.

But that's not all: the advantages of zinc coating also continue in further processing. Since most steel components in car bodies are zinc-coated and cold-formed, welding and joining are considerably simplified. The existing know-how that automotive manufacturers already possess can therefore be directly transferred without the need for investments in new equipment or qualifications.

Earlier corrosion tests on comparable steels also show better corrosion resistance than aluminium-silicon coatings. A property that can extend the lifespan of vehicle structures.

But the greatest strategic advantage of the new steels becomes apparent in the long term: the medium-manganese steels are significantly more tolerant of impuri-

ties, which is a crucial factor for the transition to green steel production. With the shift to direct reduction plants and electric arc furnaces in steel manufacturing, the proportion of scrap usage will increase, and with it the proportion of undesirable accompanying elements. Modelling shows that, even under these conditions, the new steels retain their high quality and are still suitable for high-performance applications, whereas conventional boron steels reach their limits.

On the path to series production

So far, the steels have been produced on a laboratory pilot scale and have met the strength and ductility targets set by the project team. Research is therefore focused on optimizing coating processes. By project completion in 2027, performance tests, the production of prototype components, and their validation will follow. In addition to Volkswagen Group, other OEMs and Tier-1 suppliers have already expressed interest in these novel steels.

This broad interest has a reason: by developing this new generation of steels, the WarP-AHSS consortium is overcoming the previous limitations of conventional hot-formed steels. The combination of ultra-strength, exceptional residual formability, better corrosion protection, and lower processing temperatures is a true breakthrough in steel design and aligns with the Green Steel project of Tata Steel Nederland.

The WarP-AHSS project therefore impressively demonstrates that technical innovation and sustainable steel production can go hand in hand – and that the next generation of crash structures will be safer and more energy-efficient than ever before.

■ *Tata Steel Nederland*

WarP-AHSS

The European research project "Warm Press Formed Zinc Coated Third Generation Advanced High Strength Steels (WarP-AHSS)" is developing ultra-strong medium-manganese steels for automotive crash structures. Unlike conventional hot-formed steels, these can be processed at significantly lower temperatures, allowing the zinc coating to

remain intact. The project is funded by the European Research Executive Agency (REA) on behalf of the European Commission and runs from 2023 to 2027. Partners include Tata Steel Nederland (project lead), Volkswagen Group, RWTH Aachen, CENIM (Spain), RISE (Sweden), and the French Corrosion Institute.

ULTRA-FINE MEDICAL WIRE

Life-changing solutions recognized with Alleima Innovation Prize 2026

Diabetes monitors, pacemakers and advanced hearing implants all require small, advanced wires to function. The combination of advanced engineering and deep understanding of device needs is the basis for manufacturing the ultra-fine medical wire.

For people who have suffered from heart problems, Parkinson's disease or diabetes, or who have been deaf from birth, Alleima's life-changing solutions can contribute to improved quality of life. From the start, operations manufactured wires for the hard disk drive industry, but innovations changed the business gradually and are now almost entirely about manufacturing ultra-fine wires and wire components for the medical technology industry. During the last five years, sales have almost quadrupled. The products are used, among other things, in vascular therapy, continuous glucose monitors, pacemakers and neurostimulation systems.

The Alleima Innovation Prize 2026 has been awarded to Cacie McDorman, Gary Davies, Katina Whitten and Timothy Tacionis for their exceptional work in developing medical fine wire and wire components for sensing and stimulation in minimally invasive and implantable devices. Through their expertise in engineering and precision wire manufacturing, they have developed in-house processing and coating technologies that achieve ultrafine dimensions, tight tolerances, biocompatibility and reliable stable signal transmission – all of which are crucial to meeting the demanding quality requirements of the medical industry. Their customer-centric mindset embodies Alleima's commitment to strong customer partnerships and innovation, enabling the next generation of smaller, smarter, life changing medical solutions.

One example of how the technology works is the wire used in continuous glucose monitors. The wire is the sensing component and functions as two different electrodes from the inclusion of multiple coatings. The wire is modified by the OEM to expose the different layers along the



Innovation prize winners at Alleima Annual General Meeting 2026 (from left to right): Tom Eriksson, EVP and Head of Strategic Research; Katina Whitten, Training and Development Manager, BU Medical; Cacie McDorman, Global Product Manager, Medical Wire Technologies, BU Medical; and Göran Björkman, President and CEO of Alleima (Picture: Johan Lygrell)

length in a precise way. An active chemical is applied to the surface which reacts with glucose in the interstitial fluid in the body causing a chemical reaction to the active layers on the wire. This signal can be analyzed to provide important data to the user and caregivers. Basically, it acts like a small electrochemical cell, a battery, that provides information about blood sugar concentration.

"One of the main drivers for us is the ability to solve our customers' challenges. What distinguishes our development is that what we do is something that very few are capable of. Customers often come to us after having tried other options without success. This means that products are rarely easy to design, but it is only the challenges that make it rewarding when we succeed anyway, in most cases," says Cacie McDorman, Global Product Manager, Wire Technologies.

"What motivates me the most is seeing the results of what we do, that we are doing things that improve other people's lives. When you see a video of a young child who has never heard before and that cochlear device gets turned on for the first time, it will bring tears to your eyes. In the future, we can use these technologies and platforms that we've developed and leverage them towards other parts of the medical device industry, and in particular, things like remote patient monitoring," says, Timothy Tacionis, Lead engineer, Business Unit Medical within Alleima.

The Alleima Innovation Prize is a yearly award facilitated by the Alleima Group, recognizing important and innovative achievements in product and process development.

Alleima AB

INFRASTRUCTURE APPLICATION

CO₂-reduced steel for a water pipeline project in Africa

The Quilonga Grande project secures long-term drinking water supply for the city of Luanda, capital of Angola. The sustainable development infrastructure will be supported with steel from Germany.

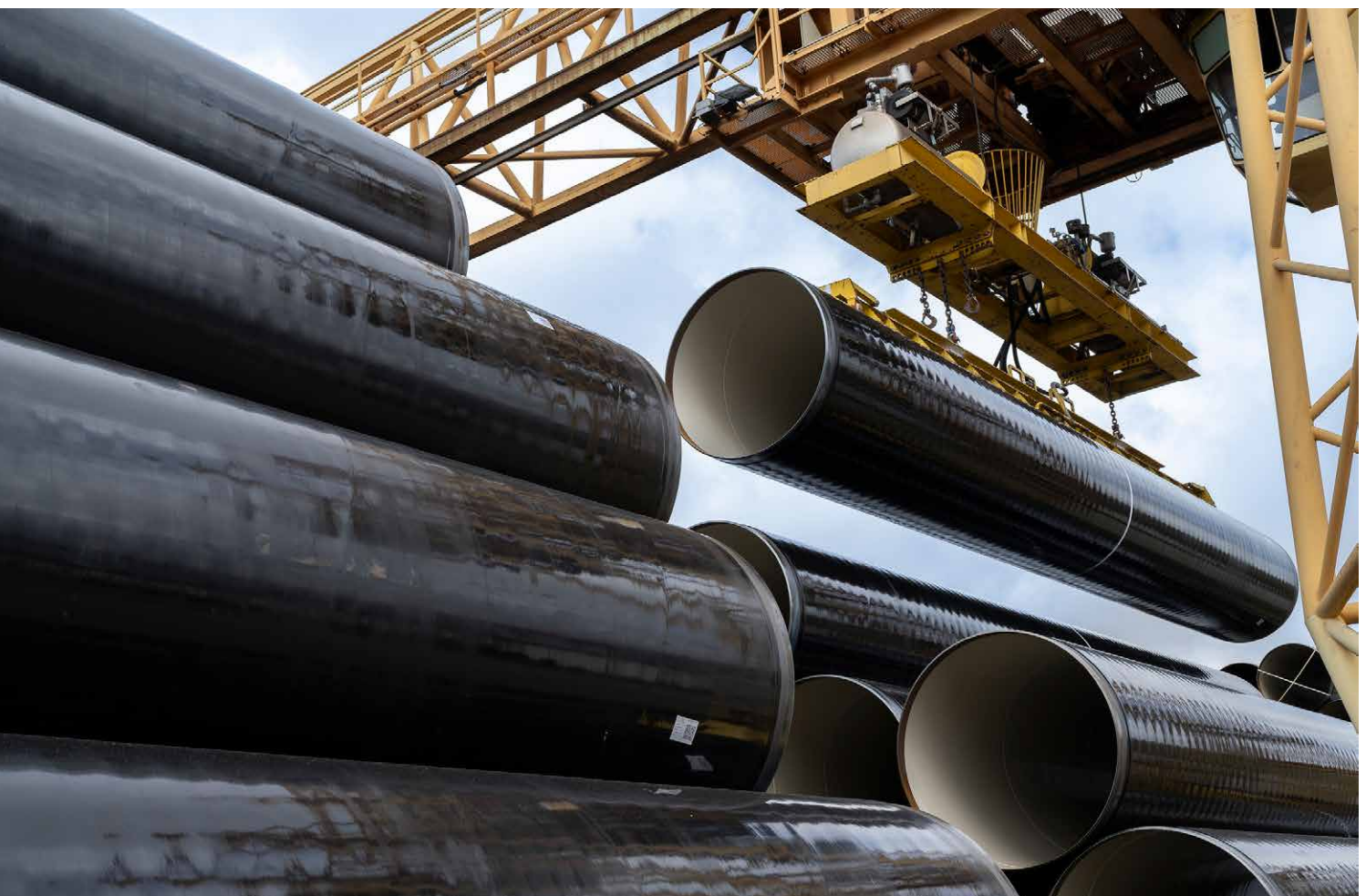
German steelmaker thyssenkrupp Steel is supplying approximately 1,000 tons of CO₂-reduced bluemint® Steel for a major water pipeline project in Angola, located in southwestern Africa. The material will be used as part of the Quilonga Grande development project, which is intended to fundamentally improve the water supply for the capital city of Luanda in the future.

The bluemint® Steel hot-rolled strip produced by thyssenkrupp Steel is pro-

cessed into spiral-welded pipes at Mannesmann Grossrohr in Salzgitter, Germany. The pipes reach lengths of 13.5 meters and – depending on the route section – diameters ranging from 508 millimeters to 1,626 millimeters. In this project, bluemint® Steel is used for pipes with a diameter of 1,220 millimeters and a wall thickness of around 12 millimeters. In total, the new water system comprises approximately 105 kilometers of pipeline.

Pipeline is a key component of Angola's water supply

The new water transport system will play a central role in supplying the city of Luanda. The metropolis, with a population of around ten million, has faced a massive drinking water deficit of approximately 1.2 million cubic meters per day for years. In many districts, water has so far been supplied primarily by tanker trucks. The new water pipeline is a key component for a



Spiral-welded pipes made from bluemint® Steel prepared for shipment (Photo: Mannesmann Großrohr)

We are taking responsibility, particularly given that this is a country which already relies heavily on renewable energy and has a comparatively low per capita CO₂ footprint.

Georgios Giovanakis, Chief Sales Officer at thyssenkrupp Steel

reliable and sustainable water supply for the population.

Georgios Giovanakis, Chief Sales Officer at thyssenkrupp Steel: “We are pleased that our bluemint® Steel is being used in this important infrastructure project. In doing so, we are taking on responsibility within the framework of long-term partnerships, as access to clean drinking water is a fundamental prerequisite for quality of life and social development.

Especially in a country that already relies heavily on renewable energy and has a comparatively low per capita CO₂ footprint, bluemint® Steel makes a meaningful contribution to further sustainable development.”

The Quilonga Grande project demonstrates how low-carbon materials can be specifically integrated into international infrastructure projects. Through the use of bluemint® Steel, thyssenkrupp Steel is

making an important technological contribution to making supply infrastructures more resilient and climate-friendly.

CO₂-reduced steel through increased scrap content

bluemint® recycled is a CO₂-reduced steel from thyssenkrupp Steel in which a specially processed scrap product is used in the blast furnace process. By using recycled material, primary raw materials can be conserved and process-related CO₂ emissions significantly reduced – without compromising the usual mechanical or processing properties.

■ *thyssenkrupp Steel*

HELSINKI'S NEW LANDMARK OPENS

SSAB's high-strength structural steel and drill piles up to 40 metres long have been used to build Kruunuvuorenselkä.

Kruunuvuori Bridge opened recently to the public, forming a new and striking element of Helsinki's skyline. It is among the largest bridge projects ever undertaken in Finland and exemplifies modern, sustainable infrastructure development.

Kruunuvuori Bridge has been designed primarily for pedestrians, cyclists and public transport. The bridge is not intended for private vehicles, supporting Helsinki's objectives to reduce transport emissions and improve urban mobility. Sustainable development and the enhancement of urban life have been at the core of the project from the very beginning.

Kruunuvuori Bridge is approximately 1,200 metres long, and its central pylon rises to a height of 135 metres, making it the longest and highest bridge in Finland. Visible from kilometres away, the bridge is already becoming a new Helsinki landmark while at the same time creating a direct and sustainable public transport connection between the city centre and the growing district of Laajasalo.

In total, approximately 6,300 tonnes of steel structures have been used in Kruunuvuori Bridge. More than 3,000 tonnes of SSAB Domex® structural steel form the backbone of the bridge's structures. SSAB has also supplied driven piles with special rock shoes, welded at its Oulainen works, in diameters of 1,220 mm and 1,016 mm, as well as drilled piles for the bridge foundations.

The design accounts for repeated exposure to ice, snow, moisture and strong winds, with a targeted service life of at least 200 years for the structures.

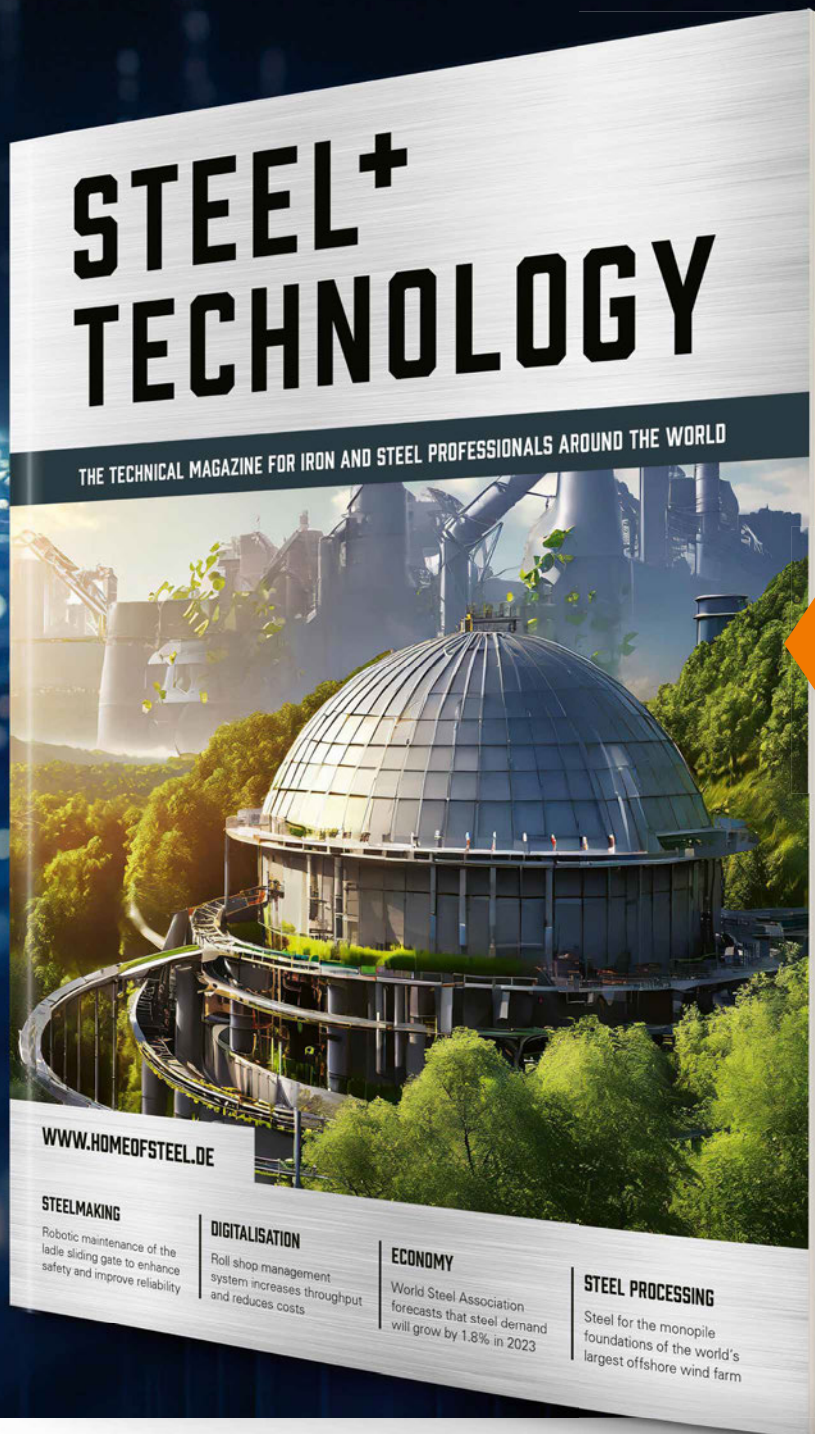


Kruunuvuori Bridge links Laajasalo with the city centre of Helsinki (Photo: SSAB)

■ *SSAB*

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AEROSPACE APPLICATION

Voestalpine secures substantial orders in the aerospace sector

For many decades, the international steel and technology group voestalpine has been recognized as one of the most reliable suppliers of high-performance materials and special forged parts for the global aerospace industry. Now, the group’s High Performance Metals Division has secured orders in the aerospace sector with a total volume of around EUR 1 billion for the next five years.



Voestalpine produces high-performance materials for the aerospace industry as well as special forged parts that are basically “ready-to-install” in the fuselage, engine, and landing gear (Picture: voestalpine)

A portion of these orders comes from the leading aircraft manufacturer Airbus and covers the entire range of services – from high-performance materials and complex forged parts to comprehensive global logistics services. Production will take place at the Austrian sites of voestalpine in Kapfenberg and Mürzzuschlag, as well as at the Brazilian subsidiary Villares Metals in Sumaré.

For the High Performance Metals Division, these orders represent the largest order volume in the aerospace sector in the group’s history to date. Voestalpine produces high-performance materials for the aerospace industry in the form of bars, sections, sheets, and plates, as well as special forged parts that are basically “ready-to-install” in the fuselage, engine, and landing gear. These high-quality products can withstand both large temperature fluctuations and rotational forces, as well as heavy mechanical loads. For these orders, voest-

alpine is supplying nickel-based alloys and forged parts for engines and landing gear, which are installed in common passenger aircrafts such as those of the Airbus A320, A330, and A350 families.

The rising demand for short- and medium-haul aircraft continues to drive growth in the aerospace segment. “These major orders are a strong signal of our innovative strength and our role as a strategic partner to the international aerospace industry. Virtually every civil aircraft comprises flies

with a high-tech product made by voestalpine. We are actively shaping the future of flying with high-performance materials and intelligent services,” emphasizes Herbert Eibensteiner, CEO of voestalpine AG. In Austria, voestalpine is one of the most important manufacturers for the aerospace industry. The high-quality materials and sophisticated special forgings produced by the steel and technology group are now an integral part of the aircraft models of the world’s leading manufacturers.

High-performance steels for international aerospace application

The production of high-quality drop-forged parts made of titanium alloys, high-alloy steels, and nickel-based alloys for large orders takes place at the Kapfenberg site. The new special steel plant in Kapfenberg supplies pre-materials, and the special forgings are also manufactured in Kapfenberg. High-tech titanium sheets for aerospace are produced in Mürzzuschlag. Global logistics services are coordinated by the company’s own international network with distribution sites in Kapfenberg, Birmingham, Chicago, Toronto, Shanghai, and Chennai.

| voestalpine

“ We are actively shaping the future of flying with high-performance materials and intelligent services. *Herbert Eibensteiner, CEO of voestalpine AG* ”

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STEEL TECHNOLOGY

Start-up of the world's most powerful Arvedi ESP plant in China

An important milestone has been reached for Arvedi ESP technology with the recent commissioning of a plant at Zhongshou Special Steel. With four roughing stands and a five-stands finishing train, this facility is the most powerful and productive Arvedi ESP line to date. Endless hot-rolled coils (eHRC) have become a game changer in the Chinese flat product market.

Resource-efficient open-die forging through predictable material properties

A new simulation model from the Fraunhofer Institute for Mechanics of Materials IWM in Freiburg has been developed to achieve the desired microstructure in open-die forging. The model predicts weak points in forged components caused by incomplete grain formation (recrystallization). Embedded in an efficient digital workflow, this creates a digital forging laboratory that enables material and energy savings in forging processes.

STEEL PROCESSING

Roll forming of complex components with the precision as a press

Presses require a large footprint, and the operating and capital costs of the machines and tooling are enormous. Is there really no alternative to a press for forming precision components? Researchers from Fraunhofer IWU and their partners have now proven that complex precision components can be formed in future using hollow embossing rolling at costs up to 70 per cent lower without any loss in quality.

STEEL MATERIALS

New steel powder for 3D printing of hot working tools

In additive manufacturing using steel powders, the choice of materials has so far been limited, as only weldable alloys can be processed. A joint German-American research team has now succeeded in developing a new class of tool steels that opens up the possibilities of 3D printing for toolmaking as well. Together, the researchers developed a novel tool steel concept designed to enable the additive manufacturing of moulds for injection moulding and die casting, for example.

Place your ad in the next issue before **18 August 2026**
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46395 Bocholt, Germany

STEEL + TECHNOLOGY is printed with the highest environmental standards.

Terms of Delivery

STEEL + TECHNOLOGY is published four times a year and is available on subscription. The price for a one-year subscription for print and e-paper is 69.00 € incl. shipment (VAT not included). Subscriptions will be renewed for the next 12 months, unless DVS Media GmbH receives a written cancellation 6 weeks prior expiration. VAT calculated in accordance with EC legislation. Single copy: 35.00 € excl. shipment

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ISSN (Print) 2628-3859

ISSN (Online) 2628-3867

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2120 Steel degassing plants

tenova
LOI THERMPROCESS

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2130 Steel desulfurization plants

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2140 T+P lance equipment

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Internet: www.loi.tenova.com

04.09 Components

2182 Burning lances (oxygen) for tundish and ladle gate valves

BEDA
Oxygentechnik

BEDA-Oxygentechnik GmbH
An der Pönt 59
40885 Ratingen, Germany
☎ +49 2102 9109-0
E-Mail: info@BEDA-com
Internet: www.BEDA.com

2270 Injection plants for argon

BEDA
Oxygentechnik

BEDA-Oxygentechnik GmbH
An der Pönt 59
40885 Ratingen, Germany
☎ +49 2102 9109-0
E-Mail: info@BEDA-com
Internet: www.BEDA.com

04.09 Components

2440 Handling equipment for oxygen/carbon lances

BEDA
Oxygentechnik

BEDA-Oxygentechnik GmbH
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40885 Ratingen, Germany
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Internet: www.BEDA.com

04.09 Components

2490 Coal dust injection lances

BEDA
Oxygentechnik

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Internet: www.BEDA.com

2530 Lance robots/-manipulators

BEDA
Oxygentechnik

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☎ +49 2102 9109-0
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Internet: www.BEDA.com

2580 Oxygen nozzles

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04.09 Components

2600 Oxygen lance equipment



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Internet: www.BEDA.com

2655 Fuses (multifunction) for burners



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☎ +49 2102 9109-0
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Internet: www.BEDA.com

2660 Special safety oxygen hose reels



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Internet: www.BEDA.com

07 Hot rolling

07.10 Components

4430 Decoilers and rewinders



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Coil Processing Equipment

GUILD International
7273 Division Street
Bedford, OH 44146, USA
☎ +1 440-232-5887
E-Mail: sales@guildint.com

08 Forging, extrusion

08.03 Components

5150 Forging manipulators



Glama Maschinenbau GmbH
Hornstr. 19
45964 Gladbeck, Germany
☎ +49 2043 9738-0
☎ +49 2043 47268
Internet: www.glama.de

5155 Forging manipulators, rail-mounted



Glama Maschinenbau GmbH
Hornstr. 19
45964 Gladbeck, Germany
☎ +49 2043 9738-0
☎ +49 2043 47268
Internet: www.glama.de

5160 Forging robots



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10 Cold rolling

10.04 Annealing lines

5670 Annealing lines



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11 Surface treatment

11.05 Aluminizing, tin plating, galvanizing

6630 Hot dip galvanizing lines



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14 Sheet metal processing

14.03 Welding technology

8120 Strip welding machines



GUILD International
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E-Mail: sales@guildint.com

14.03 Welding technology

8205 Laser welding machines



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8210 Laser beam welding machines



GUILD International
7273 Division Street
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8220 MIG, MAG and TIG\057TIG welding torches



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8257 Rolling seam resistance welding equipment



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14.03 Welding technology

8330 Welding machines, general



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8360 Welding accessories, general



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8380 Butt welding machines, electric



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8400 Resistance welding equipment



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16 Furnace and energy technology

10170 Furnace optimization (conversion to low NOx combustion)



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☎ +49 7159 2738
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10190 Rational use of energy



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16.02 Forging furnaces

10230 Forging furnaces



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16.03 Roller Hearth Continuous Furnaces

10260 Roller Hearth Continuous Furnaces



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10270 Roller hearth and walking beam furnaces



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16.05 Top-hat furnaces

10310 Top-hat furnaces



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16.08 Heating furnaces and heat treatment plants

10408 Continuous furnaces



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10410 Co-step furnaces



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10430 Bogie hearth furnaces



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10460 Chamber furnaces



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16.08 Heating furnaces and heat treatment plants

10510 Roller hearth and walking beam furnaces



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10540 Pusher-type, roller and rotary hearth furnaces



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10560 Heat treatment plants

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10562 Heat treatment furnaces (continuous and discontinuous)

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10570 Heat treatment furnaces for batch operation, open heated

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16.09 Bath furnaces

10580 Aluminum melting furnaces

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16.13 Components

10890 Natural gas burners



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Dornierstr. 14
71272 Renningen, Germany
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☎ +49 7159 2738
E-Mail: ws@flox.com
Internet: www.flox.com

11010 Regenerative burners



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Dornierstr. 14
71272 Renningen, Germany
☎ +49 7159 1632-0
☎ +49 7159 2738
E-Mail: ws@flox.com
Internet: www.flox.com

11020 Recuperative burners



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☎ +49 7159 2738
E-Mail: ws@flox.com
Internet: www.flox.com

16.13 Components

11070 Radiant tube burners



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Internet: www.flox.com

17 Refractory technology

17.03 Refractory materials and equipment

11481 Fiber ceramic moldings, vacuum formed, up to 1750 °C

RATH

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Refractory Solutions®

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1010 Wien, Austria
☎ +43 1 5134427- 0
☎ +43 1 5134427-2186
E-Mail: info@rath-group.com
Internet: www.rath-group.com

11485 Fiber mats and felts up to 1600 °C

RATH

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☎ +43 1 5134427-2186
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Internet: www.rath-group.com

17.03 Refractory materials and equipment

11510 Refractory concrete

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Internet: www.rath-group.com

11580 Lightweight refractory and insulating bricks

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Refractory Solutions®

RATH AG

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Internet: www.rath-group.com

17.03 Refractory materials and equipment

11960 High-alumina bricks (andalusite, bauxite, corundum, mullite, sillimanite bricks)

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18 Machinery and plant engineering

12210 Plant engineering, general

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18.06 Ventilation plants and equipment

12660 Air conditioners for heat plants

FRIGOR TEC
Cooling to the point

FrigorTec GmbH

Hummelau 1
88279 Amtzell, Germany
☎ +49 7520 914820
E-Mail: info@frigortec.com
Internet: www.frigortec.com

12670 Air conditioners for crane lances, crane bridges, etc.

FRIGOR TEC
Cooling to the point

FrigorTec GmbH

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88279 Amtzell, Germany
☎ +49 7520 914820
E-Mail: info@frigortec.com
Internet: www.frigortec.com

18.10 Power and work machines

13070 Piston pumps

HYDROWATT
high pressure pumps

HYDROWATT AG

Freistrasse 2
8200 Schaffhausen, Switzerland
☎ +41 52 624 53 22
E-Mail: info@hydrowatt.com
Internet: www.hydrowatt.com

18.10 Power and work machines

13160 Vacuum pumps

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21 Measuring and testing technique

21.02 Measurement of physical properties

16608 Strip thickness control (AGC)

Polytec

POLYTEC GmbH

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76337 Waldbronn, Germany
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☎ +49 7243 69944
E-Mail: info@polytec.de
Internet: www.polytec.de

21.02 Measurement of physical properties

16652 Dressing degree and mass flow measuring systems

Polytec

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21.02 Measurement of physical properties

16830 Speed measuring devices

Polytec

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21.02 Measurement of physical properties

16910 Length measuring devices for tubes



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16950 Length and speed measuring systems (optical)



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16960 Laser speed and length measuring systems



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24 Environmental protection and disposal

24.01 Dedusting and gas cleaning

18360 Exhaust gas cooling systems



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18400 Treatment of dusts from steel mills and foundries



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Gustav Eirich GmbH & Co KG**
Walldürmer Str. 50
74736 Hardheim, Germany
☎ +49 6283 51-0
☎ +49 6283 51-325
E-Mail: eirich@eirich.de
Internet: www.eirich.de

02 Raw material pretreatment

02.01 Ore dressing

740 Mixers/core sand mixers



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03 Iron making

03.01 Blast furnaces

1150 Heat recovery systems



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03.02 Direct reduction plants

1160 Direct reduction plants



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04 Steelmaking

1668 Equipment for steelmaking plants



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Coil Processing Equipment
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04.04 Electric steel plant

1875 Electric arc ladle furnaces



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04.07 Secondary metallurgy

2028 Equipment for chemical heating



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2030 Argon purging equipment



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04.07 Secondary metallurgy

2080 Ladle metallurgical plants



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2110 Secondary metallurgical plants



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